JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

Board of Mechanical Rules
Okemos Office Building
2501 Woodlake Circle
Conference Room 3
First Floor
Okemos, Michigan
November 12, 2008
9:00 a. m.

- A G E N D A -

1.	Call to Order and Determination of Quorum	Chairperson
2.	Committee of the Whole Meeting 09/17/2008	Chairperson
3.	Applicants for Registration	T. Barry
	Jerrod N. Keni Richard G. Robinette Rock L. Sherburn Richard J. Teal, Jr.	
4.	Examination Appeals	T. Barry
	Document M-08-23 – Kevin Brocklebank Document M-08-24 – Donald Scott	
5.	Request to Appear Before the Board	T. Barry
	Document M-08-25 – William Ward	
6.	Product Approval	T. Barry
	Document M-08-21 – Vapor Vent Document M-08-22 – The Melting Pot	

7.	Old Business	Chairperson
	Document M-08-16 – David Sexton (tabled 09/17/08) Document M-08-13 – Ronald Kowalski (T. Barry Report) Document M-08-11 – Robert Walker (tabled 07/16/08, 09/17/08	
8.	New Business	Chairperson
9.	Legislative Report	T. Barry
10.	Public Comment	Chairperson
11.	Adjournment	Chairperson

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact Claudia Tenny at 517/241-9325 at least (10) working days before the event.

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

BOARD OF MECHANICAL RULES
DEPARTMENT OF LABOR AND ECONOMIC GROWTH
BUREAU OF CONSTRUCTION CODES

Conference Room 3
2501 Woodlake Circle
Okemos, Michigan 48864

MINUTES

September 17, 2008
9:00 a.m.

MEMBERS PRESENT

Mr. H. Edward Bartram
Mr. Joseph Connors
Mr. Lawrence Hale II
Mr. Robert Jagenberg
Mr. Patrick Maher
Mr. George B. Shields
Mr. Christopher Stockwell

MEMBERS ABSENT

Mr. Charles Inman
Mr. Mark Mangione
Mr. Michael Ogletree
Mr. Gregory Parker
Mr. William P. Steele
Mr. Gary VanOchten
Mr. Charles Wash
Mr. Gary VanOchten
Fire Marshal Representative

DRAFT

MICHIGAN DEPARTMENT OF LABOR & ECONOMIC GROWTH PERSONNEL ATTENDING

Mr. Tennison B. Barry, Chief, Mechanical Division, Bureau of Construction Codes
Ms. Claudia Tenny, Secretary, Mechanical Division, Bureau of Construction Codes
Ms. Beth Aben, Deputy Director, Bureau of Construction Codes
Mr. Kevin Kalakay, Assistant Chief, Mechanical Division, Bureau of Construction Codes
Mr. Scott Fisher, OLGCS, Bureau of Construction Codes

OTHERS IN ATTENDANCE

David Sexton
David Rudy
Mr. Lynn Briggs
Mr. Stephen Wylie
Daniel Gentry

Tony Zimmerman, Omega Flex
Bill Rich, Omega Flex
Ronald Kowalski
Cindy Maher, MPMCA

1. CALL TO ORDER AND DETERMINATION OF QUORUM

Mr. Robert Jagenberg, Chairperson, called the meeting to order at 9:00 a.m. Roll was called. There was not a quorum. Those members present convened as a Committee of the Whole.

2. APPROVAL OF MINUTES

Mr. Bartram made a **MOTION** to approve the minutes of the July 16, 2008 meeting, seconded by Mr. Shields. **MOTION CARRIED.**

3. APPLICANT FOR REGISTRATION

Mr. Bartram made a **MOTION** to approve the following for registration as Mechanical inspector, seconded by Mr. Shields. **MOTION CARRIED.**

Frederick H. Cook

4. EXAMINATION APPEAL

Document M-08-16 – David Sexton. Mr. Sexton appeared before the Board to appeal the denial by staff of his application for Mechanical Contractor Licensing Examination. Mr. Barry explained the basis of the denial. The Committee reviewed the information submitted by Mr. Sexton. Mr. Sexton answered questions from various Committee members. A **MOTION** was made by Mr. Bartram and seconded by Mr. Hale to table the appeal until the November 12, 2008 meeting to allow staff to evaluate information submitted by Mr. Sexton at the meeting. **MOTION CARRIED.**

5. REQUEST TO APPEAR BEFORE THE BOARD

Document M-08-17 – David Rudy. Mr. Rudy appeared before the Committee to appeal the denial by staff of his application for Mechanical Contractor Licensing Examination pursuant to the Former Offenders Act. Mr. Barry explained the basis of the denial. Mr. Rudy answered question from various Committee members. A **MOTION** was made by Mr.

Bartram and seconded by Mr. Connors that Mr. Rudy be approved to take the examination. **MOTION CARRIED.**

6. **PRODUCT APPROVAL**

Document M-08-18 – Excelamerica,GasFlex. Mr. Barry described the product submitted for approval and recommended denial for the following reasons: plastic piping cannot be installed inside; the aluminum extruded tube is not seamless as required. There were questions from various Committee members. A **MOTION** was made by Mr. Bartram and seconded by Mr. Connors to accept the recommendation of Mr. Barry to deny the Product approval. **MOTION CARRIED**

Document M-08-19 – Omega Flex, Counter Strike. Mr. Bill Rich and Tony Zimmerman were present representing Omega Flex. Mr. Barry gave a description of the product submitted for approval. Mr. Barry further stated his recommendation that the product be approved with the following conditions: must be installed to the Michigan Mechanical Code; must be installed to the International Fuel Gas Code. Mr. Rich also gave a description of the product and its function and answered question from various Committee members. A **MOTION** was made by Mr. Bartram and seconded by Mr. Hale to accept the recommendation of Mr. Barry and accept the product with the stated conditions. **MOTION CARRIED.**

Document M-08-20 – Omega Flex, Omega Flex Trac PS II. Mr. Bill Rich and Tony Zimmerman were also representing this product. Mr. Barry gave a description of the product and information submitted. Mr. Barry recommended denial of the product as it does not comply with sec 404.11 of the 2000 International Fuel Gas Code. Mr. Rich addressed the Committee with remarks regarding the product and its application and answered questions from various committee members. There was extended discussion regarding the product and the interpretation of the Code between Mr. Rich, Mr. Zimmerman and committee members. A **MOTION** was made by Mr. Bartram and seconded by Mr. Hale to table the issue until the November 12, 2008, to allow staff to do more research. **MOTION CARRIED.**

7. **OLD BUSINESS**

Document M-08-11 – Robert Walker (tabled 07/16/08) A **MOTION** was made by Mr. Bartram and seconded by Mr. Hale to remove the document from the table. Mr. Walker did not appear at the meeting. Mr. Barry explained the basis of the denial based on the Former Offenders Act to allow applicant to submit additional information. Mr. Barry reported that Mr. Walker did submit one letter which the committee reviewed. A **MOTION** was made by Mr. Hale and seconded by Mr. Connors to again table the document until the November meeting. **MOTION CARRIED.**

Document M-07-30 – Reginald McKinney (tabled 11/14/07, 01/23/08, 03/19/08, 05/14/08, 07/16/08. A **MOTION** was made by Mr. Bartram and seconded by Mr. Maher to remove the document from the table. **MOTION CARRIED.** Mr. Kalakay reported that since this document has been tabled several times it is recommended to refer this back to the Administrative Law Judge for review so that all parties can state their case. There was discussion regarding the issue and Ms. Beth Aben and Mr. Scott Fisher also answered questions. A **MOTION** was made by Mr. Hale and seconded by Mr. Stockwell to accept the recommendation of staff and refer the matter back to the Administrative Law Judge. **MOTION CARRIED.**

8. **NEW BUSINESS**

Proposed meeting dates for 2009 were presented. A **MOTION** was made by Mr. Bartram and seconded by Mr. Hale. **MOTION CARRIED.**

9. **LEGISLATIVE REPORT**

Mr. Barry reported HB 6353 has been introduced that would require anyone doing fire suppression work would need to be licensed as an apprentice, journeyman or contractor through the Office of Fire Safety and anyone on the job would need the license, not the company. This would be a separate license from the Mechanical License. There was discussion regarding this issue.

10. **PUBLIC COMMENT**

Mr. Briggs reported that there is now a Senate Bill SB 1486 introduced 09/11/08 that appears to be identical to the House Bill. Mr. Briggs further reported that he had been informed by ICC that there are two bills in U. S. Congress called the Community Building Code Administration Grant Act of 2007. S2458 was introduced 12/12/07 and has been referred to Senate Banking Committee and HR4461 introduced the same day and has been referred to the House Financial Services Committee. The legislation would provide one hundred million dollars nationwide to code enforcement groups. Apparently the people who sponsored this legislation are concerned that codes are not enforced as they should be. Any community can apply for a grant up to one million dollars to provide code enforcement. Mr. Briggs also discussed the last Forbes ad hoc committee draft and there is a need to get the committee back together, possibly after the first of the year.

Board member Mr. Joseph Connors related to the Board that his term on the Board has expired and expressed that he was honored to serve on the Board and Chairperson Mr. Jagenberg expressed gratitude for his service.

11. **ADJOURNMENT** DRAFT

A **MOTION** to adjourn was made by Mr. Bartram and seconded by Mr. Shield. **MOTION CARRIED.**

Next Board of Mechanical Rules Meeting November 12, 2008

APPROVED _____ **DATE** _____

Mr. Robert Jagenberg, Chairperson

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

BOARD OF MECHANICAL RULES
DEPARTMENT OF LABOR AND ECONOMIC GROWTH
BUREAU OF CONSTRUCTION CODES

Conference Room 3
2501 Woodlake Circle
Okemos, Michigan 48864

MINUTES

July 16, 2008
9:00 a.m.

MEMBERS PRESENT

Mr. H. Edward Bartram
Mr. Robert Jagenberg
Mr. Patrick Maher
Mr. Mark Mangione
Mr. Gregory Parker
Mr. George B. Shields
Mr. Christopher Stockwell
Mr. Charles Wash

MEMBERS ABSENT

Mr. Joseph Connors
Mr. Lawrence Hale II
Mr. Charles Inman
Mr. Michael Ogletree
Mr. William Steele
Mr. Gary VanOchten

MICHIGAN DEPARTMENT OF LABOR & ECONOMIC GROWTH PERSONNEL ATTENDING

Mr. Tennison B. Barry, Chief, Mechanical Division, Bureau of Construction Codes
Ms. Claudia Tenny, Secretary, Mechanical Division, Bureau of Construction Codes
Ms. Beth Aben, Deputy Director, Bureau of Construction Codes
Mr. Kevin Kalakay, Assistant Chief, Mechanical Division, Bureau of Construction Codes
Mr. Scott Fisher, OLGCS, Bureau of Construction Codes
Mr. Rory Ward, State Mechanical Inspector

OTHERS IN ATTENDANCE

Ronald Kowalski
Thomas Ballard
Robert Walker
Jack Berry, Midwest Church Design, Ltd.
Don Dornbush, Meridian Christian Church
Mr. Lynn Briggs

1. **CALL TO ORDER AND DETERMINATION OF QUORUM**

Mr. Robert Jagenberg, Chairperson, called the meeting to order at 9:00 a.m. Roll was called and a quorum was determined.

2. **APPROVAL OF MINUTES**

Mr. Bartram made a **MOTION** to approve the minutes of the May 14, 2008 meeting, seconded by Mr. Mangione. **MOTION CARRIED.**

3. **APPLICANT FOR REGISTRATION**

Mr. Bartram made a **MOTION** to approve the following for registration as Mechanical inspector, seconded by Mr. Shields. **MOTION CARRIED.**

Jonathan E. Dolbee
George W. Martin III
Richard Q. Wight

2. **SETTLEMENT AGREEMENTS**

BCC Complaint No. 08-0040-M, Bureau of Construction Codes vs. Stewart G. Nunnelley. Mr. Barry reviewed the details of the Settlement Agreement regarding Steward Nunnelley. .Mr. Scott Fisher, OLGCS, answered questions from various Board Members related to the submitted agreement. A **MOTION** was made by Mr. Parker and seconded by Mr. Stockwell to approve the Settlement Agreement, 1) Respondent's mechanical contractor license shall be revoked; 2) Respondent will not apply for renewal of his mechanical contractor license for a period of seven (7) years and will, at that time, be required to pass all new licensing examinations in order to qualify for a license renewal; 3) Respondent will not pay a CIVIL FINE to the State of Michigan. **MOTION CARRIED.**

BCC Complaint No. 05-0445-M, Bureau of Construction Codes vs. Daniel E. "Dan" Hogan, d/b/a Hogan Plumbing & Heating. Mr. Scott Fisher, OLGCS, reviewed the details of the Settlement Agreement regarding Daniel "Dan" Hogan and answered questions from various Board Members related to the agreement. Mr. Barry also answered questions related to the agreement. A **MOTION** was made by Mr. Bartram and seconded by Mr. Shields to approve the Settlement Agreement, 1) Respondent Daniel E. "Dan" Hogan's mechanical contractor license shall be PERMANENTLY REVOKED. Respondent further agrees that he will not

make application in the future to become licensed as a Mechanical Contractor or practitioner in the mechanical field in the State of Michigan. 2) Respondent Daniel E. "Dan" Hogan shall pay a CIVIL PENALTY to the State of Michigan, in the amount of $2,000. 3) Respondent and/or Hogan Plumbing shall pay $500 of the above stipulated civil penalty within 30 days from the date of this agreement. The remainder of the civil penalty or $1,500 shall be paid within one year from the date of this agreement with $750 being paid within 6 months from the date of this agreement and with the remaining $750 being paid within 12 months from the date of this agreement. **MOTION CARRIED.**

5. **EXAMINATION APPEALS**

Document M-08-13 Ronald Kowalski. Mr. Kowalski appeared before the Board to appeal the denial of his application for Mechanical Contractor Licensing Examination in #5, Limited heating service. Mr. Barry explained the basis of the denial. Mr. Kowalski discussed his work experience and answered questions from various Board Members. A **MOTION** was made by Mr. Bartram and seconded by Mr. Parker to table the appeal to allow Mr. Kowalski to submit additional work experience information. **MOTION CARRIED.**

Document M-08-14 Thomas Ballard. Mr. Ballard appeared before the Board to appeal the denial by staff of his application for Mechanical Contactor Licensing Examination. Mr. Barry explained the basis of the denial and Mr. Ballard related his work experience and answered questions from various Board Members. A **MOTION** was made by Mr. Wash and seconded by Mr. Bartram to accept staff recommendation to deny appeal. **MOTION CARRIED.**

6. **REQUEST TO APPEAR BEFORE THE BOARD**

Document M-08-11 Robert Walker. Mr. Walker appeared before the Board to appeal the denial by staff for Mechanical Contractor Licensing Examination pursuant to the Former Offenders Act, 1974 PA 381. Mr. Barry reviewed the basis of the denial. Mr. Walker answered questions from various Board Members. A **MOTION** was made by Mr. Parker and seconded by Mr. Maher to table the appeal to allow Mr. Walker to submit appropriate documentation. **MOTION CARRIED.**

Document M-08-15 Michael Ruhl. Mr. Ruhl did not appear before the Board to request reconsideration of the Board denial of his application for Mechanical Contractor Licensing Examination. A **MOTION** was made by Mr. Parker and seconded by Mr. Bartram to deny reconsideration of the Board decision to deny his appeal. **MOTION CARRIED.**

7. **APPEAL HEARING**

Appeal Document CCC-MECH 08-007 Midwest Church Design; Ltd, Jack Berry, Petitioner vs. Bureau of Construction Codes, Respondent. All present offering testimony were sworn in.

The Board heard the appeal and response and their decision was that the installation of two ranges without a hood is in violation of MMC Section 507.2.2 as there is not an exception that is applicable. The Bureau of Construction Codes made no error in the interpretation and application of the Michigan Mechanical Code and a compelling argument of practical difficulty or alternative compliance was not made. Therefore, it is ordered that the request for relief from the requirements of 507.2.2 be denied and there should be, at a minimum, a type 2 hood.

8. **OLD BUSINESS**

Document M-07-30 Reginald T. McKinney (tabled 11/14/07, 01/23/08, 3/19/08, 05/14/08)

A **MOTION** was made by Mr. Bartram and seconded by Mr. Mangione to remove the item from the table. **MOTION CARRIED.** Mr. Fisher addressed the Board regarding the issues involved in the Recommendation of the Administrative Law Judge. There was discussion among Board Members regarding the issues. A **MOTION** was made by Mr. Mangione and seconded by Mr. Bartram to again table this matter. **MOTION CARRIED.**

9. **NEW BUSINESS**

Ms. Beth Aben informed the Board that Friday, July 11, 2008 was Mr. Henry Green's last day with the Bureau and that he would be moving to Washington, D.C. as President/Director of National Institute of Building Sciences. The Bureau is in the process of filling Mr. Green's position but there is no final approval at this point. The Board will be informed of a retirement party honoring Mr. Green later this year.

10. **LEGISLATIVE REPORT**

Mr. Barry discussed a change in the Boiler Law to allow mechanical contractors to install residential boilers, 5 families or less. Contractor must have the license classifications of #1, hydronic heating & cooling and process piping. The Mechanical Exam is being changed to include questions related to boiler installation.

11. **PUBLIC COMMENT**

Mr. Lynn Briggs reported that he spoke with the legislative liaison for the Department of Labor and Economic Growth and it does not appear that legislation regarding the Forbes Act will be introduced until the next session of the legislature. It is hoped a final draft will be forthcoming.

Mr. Briggs also addressed the issue of fee structure for the Bureau, various members of the industry testified at numerous hearings; however, the bill is still in the Appropriations Committee. This should be handled in the fall session.

12. ADJOURNMENT

A **MOTION** was made by Mr. Shields and seconded by Mr. Bartram to adjourn the meeting. **MOTION CARRIED.**

Next Board of Mechanical Rules Meeting September 17, 2008

APPROVED _____ **DATE** _____

Mr. Robert Jagenberg, Chairperson

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

September 4, 2008 **M-08-17**

TO: Members of the Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Good Moral Character

APPLICANT REPRESENTATIVE:

David Rudy

PROJECT:

Not applicable.

AUTHORITY:

The Forbes Mechanical Contractors Act, 1984 PA 192 of the Michigan Compiled Laws.

REQUEST:

Applicant appeals denial of application for license examination. Application was denied based on good moral character.

APPLICABLE RULE:

R 338.903a. of the Board of Mechanical Rules License Examination Procedures

RECOMMENDATION:

Staff has no recommendation.

STATE OF MICHIGAN
JENNIFER M. GRANHOLM
GOVERNOR
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING
KEITH W. COOLEY
DIRECTOR

DATE: September 4, 2008 M-08-18

TO: Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Approval of Product

The items listed below have been reviewed by Mechanical Division staff.

The manufacturers, the products, and the recommendations of the Mechanical Division for approval or disapproval of the items for installation in the State of Michigan are as follows:

Manufacture:	Excelamerica
Product:	GasFlex
Description:	Aluminum pipe fittings coextruded with a tough and seamless PE jacket inside and outside.
Test Results:	SAI GOLBAL , SGS (Swiss Certification Services)
Recommendation:	Approval **not** recommended for installation in the State of Michigan for the following reason(s). 1. Plastic tubing can not be installed inside.

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

September 2, 2008

Mr. Camilo Mejia
ExcelAmerica LLC
8306 NW 56th St.
Miami, FL 33166

Dear Mr. Mejia:

On September 17, 2008, the Board of Mechanical Rules will consider your application for Approval of a Product.

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

July 1, 2008

Mr. Camilo Mejia
ExcelAmerica LLC
8306 NW 56th St.
Miami, FL 33166

Dear Mr. Mejia:

On June 20, 2008, I sent you a letter indicating that The Board of Mechanical Rules would consider your application for Approval of a Product at their meeting on July 16, 2008.

However, in examining the information you sent, I find I will need some additional information from you before this application can be brought to the Board, i.e., I need a sample of the material (product to be approved) along with copies of the standard listed that the product was tested to.

If you have any further questions, please do not hesitate to contact me and again, this application will not be presented at the July meeting. I regret any inconvenience.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

Claudia,
Attached are the samples including Pipe with all the Fittings and the tool KIT.
The 18 booklets were shipped on July 3. Thank you.
Catalina Mejia.
Ph-305-5925269.

Providing for Michigan's Safety in the Built Environment

BUREAU OF CONSTRUCTION CODES
P.O. BOX 30254 • LANSING, MICHIGAN 48909
Telephone (517) 241-9325 • Fax (517) 241-9308
www.michigan.gov/dleg

the two systems will result in nonconformance with this specification.

2. Referenced Documents

B210 Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes
B221 Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
B429 Specification for Aluminum-Alloy Extruded Structural Pipe and Tube
B483 Specification for Aluminum and Aluminum-Alloy Drawn Tubes for General Purpose Applications
B557 Test Methods of Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products
B557M Test Methods of Tension Testing Wrought and Cast Aluminum- and Magnesium-Alloy Products [Metric]
B594 Practice for Ultrasonic Inspection of Aluminum-Alloy Wrought Products for Aerospace Applications
B647 Test Method for Indentation Hardness of Aluminum Alloys by Means of a Webster Hardness Gage
B648 Test Method for Indentation Hardness of Aluminum Alloys by Means of a Barcol Impressor
B660 Practices for Packaging/Packing of Aluminum and Magnesium Products
B666/B666M Practice for Identification Marking of Aluminum and Magnesium Products
B807 Practice for Extrusion Press Solution Heat Treatment of Aluminum Alloys
B918 Practice for Heat Treatment of Wrought Aluminum Alloys
E1004 Practice for Determining Electrical Conductivity Using the Electromagnetic (Eddy-Current) Method
E1251 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Argon Atmosphere, Point-to-Plane, Unipolar Self-Initiating Capacitor Discharge
E18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
E227 Test Method for Optical Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique
E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications
E34 Test Methods for Chemical Analysis of Aluminum and Aluminum-Base Alloys
E527 Practice for Numbering Metals and Alloys (UNS)
E55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition
E607 Test Method for Atomic Emission Spectrometric Analysis of Aluminum and Aluminum Alloys by the Point-to-Plane Technique, Nitrogen Atmosphere
E716 Practices for Sampling Aluminum and Aluminum Alloys for Spectrochemical Analysis
G47 Test Method for Determining Susceptibility to Stress-Corrosion Cracking of 2xxx and 7xxx Aluminum Alloy Products
MIL-STD-129 Marking for Shipment and Storage

AMS 2772 Heat Treatment of Aluminum Alloy Raw Materials
Fed. Std. No. 123 Marking for Shipment (Civil Agencies)
H35.1 Alloy and Temper Designation Systems for Aluminum
H35.1(M) Alloy and Temper Designation Systems for Aluminum
H35.2 Dimensional Tolerances for Aluminum Mill Products
H35.2(M) Dimensional Tolerances for Aluminum Mill Products

Index Terms

aluminum alloy; seamless extruded tube; seamless pipe; ICS Number Code 77.150.10

ASTM B241 / B241M

Citing ASTM Standards

[Back to Top]

ASTM B241 / B241M - 02

ASTM B241 / B241M - 02 Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube

Active Standard ASTM B241 / B241M Developed by Subcommittee: B07.03 |**Book of Standards Volume:** 02.02

ASTM B241 / B241M

1. Scope

1.1 This specification covers aluminum and aluminum-alloy seamless pipe in the alloys (Note 1) and tempers shown in Table 1 [Table 2] and extruded round seamless tube in the alloys and tempers shown in Table 3 [Table 4] intended for pressure applications. The standard sizes for seamless pipe are listed in Table 16.7 of ANSI H35.2 and H35.2M. Nonstandard alloys, tempers, and sizes of pipe are produced as seamless extruded tube.

Note 1—Throughout this specification, use of the term *alloy,* in the general sense, includes aluminum as well as aluminum alloy.

Note 2—For other seamless drawn tubes, see Specification B 210 or Specification B 483. For extruded tube see Specification B 221, and for structural pipe and tube see Specification B 429.

1.2 Alloy and temper designations are in accordance with ANSI H35.1 and H35.1M. The equivalent Unified Numbering System alloy designations are those of Table 5preceded by A9, for example, A91100 for aluminum 1100 in accordance with Practice E 527.

1.3 For acceptance criteria for inclusion of new aluminum and aluminum alloys in this specification, see Annex A2.

1.4 The values stated in either inch-pound or SI units are to be regarded separately as standard. The SI units are shown either in brackets or in separate tables. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from

gasFlex

EXCEL

Excelamerica LLC.

May 9, 2008

Michigan Dept. of Labor & Economic Growth
Bureau of Construction Codes
Mechanical Division
P.O. Box 30255
7150 Harris Drive
Lansing, MI 48909

RE: Application for Approval of Material

Dear Sirs,

The gasFlex (R) Flexible Gas Piping System, from Excel, is a complete natural gas and propane piping system internationally certified by SGS www.sgs.com to AS4176. Used in Europe and in Australia for over 10 years, this technology is now revolutionizing the way gas is installed in America.

gasFlex alluminum alloy piping and fittings is ASTM B241 aluminum pipe lined with inner and outer layers of UV resistant polyethylene (PE). Aluminum tubing complies to the International Fuel Gas Code 2006 and the Michigan Mechanical Code 2006 Sec.403.5.3 - 403.6 and 301.3 respectively.

gasFlex is a durable, reliable tubing that will not corrode or rust. The flexibility of gasFlex tubing results in easy rollouts. The stay-in-place rigid feature of the tubing makes it ideal for:

- Interior gas piping systems
- Underground gas piping systems
- Running gas lines to remote areas in the yard (BBQ -Jacuzzi - Space heater)

We would like to make a dissertation on the subject as follows:

www.gasflex.com
8306 NW 56th Street , Miami , FL 33166
Ph: 305 851 3223 Fax 206 495 0816
info@gasflex.com

gasFlex

EXCEL

Excelamerica LLC.

A tube is formed continuously (such as an extrusion), whereas a pipe is rolled from sheet material and seamed along its length. Tubes can have an end on them (test tubes) rounded at one end. Pipes are always open on both ends.

gasFlex alluminum alloy tubing and fittings is an ASTM B241 material lined with inner and outer layers of UV resistant polyethylene (PE). The International Fuel Gas Code 2006 has Alluminum alloy listed as acceptable piping materials and methods.

From the website http://www.principalmetals.com/specifications/astm-asme.htm we have that ASTM B241 standard covers a wide range of tubes and pipes and alloys:

- Covers 1060 Aluminum in Pipe- Seamless
- Covers 2014 Aluminum in Pipe- Seamless
- Covers 1100 Aluminum in Pipe- Seamless
- Covers 3003 Aluminum in Pipe- Seamless
- Covers 3003 Aluminum in Tube, Extruded, Seamless
- Covers 1060 Aluminum in Tube, Extruded, Seamless
- Covers 2024 Aluminum in Tube, Extruded, Seamless
- Covers 1100 Aluminum in Tube, Extruded, Seamless
- Covers 2014 Aluminum in Tube, Extruded, Seamless
- Covers 2219 Aluminum in Tube, Extruded, Seamless
- Covers 2219 Aluminum in Pipe- Seamless
- Covers 5083 Aluminum in Pipe- Seamless
- Covers 5086 Aluminum in Pipe- Seamless
- Covers 5086 Aluminum in Tube, Extruded, Seamless
- Covers 5454 Aluminum in Pipe- Seamless
- Covers 5454 Aluminum in Tube, Extruded, Seamless
- Covers 5456 Aluminum in Pipe- Seamless
- Covers 5083 Aluminum in Tube, Extruded, Seamless
- Covers 6061 Aluminum in Tube, Extruded, Seamless
- Covers 6061 Aluminum in Pipe- Seamless
- Covers 6063 Aluminum in Pipe- Seamless
- Covers 6063 Aluminum in Tube, Extruded, Seamless
- Covers 7072 Aluminum in Pipe- Seamless
- Covers 7072 Aluminum in Tube, Extruded, Seamless
- Covers 7075 Aluminum in Pipe- Seamless
- Covers 7075 Aluminum in Tube, Extruded, Seamless

www.gasflex.com
8306 NW 56th Street , Miami , FL 33166
Ph: 305 851 3223 Fax 206 495 0816
info@gasflex.com

gasFlex

EXCEL

Excelamerica LLC.

- ☐ Covers 7178 Aluminum in Pipe- Seamless
- ☐ Covers 7178 Aluminum in Tube, Extruded, Seamless
- ☐ Covers 5456 Aluminum in Tube, Extruded, Seamless
- ☐ Covers 5052 Aluminum in Pipe- Seamless
- ☐ Covers 5052 Aluminum in Tube, Extruded, Seamless
- ☐ Covers 2014 Aluminum in Forging - Open Die

In the case of gasFlex we have 7075 alloy aluminum pipe, coextruded with a tough and seamless PE jacket , thus complying with NFPA 54.

We are attaching a Petition Application for Approval of Material and several reports , standards and approvals by other agencies relating to gasFlex.

We therefore request approval rating at the State level for this material.

Best Regards,

Camilo Mejia
ExcelAmerica LLC
305 851 3223

Petition Application for Approval of Material, Product or Method

Michigan Department of Labor & Economic Growth
Bureau of Construction Codes
P.O. Box 30255, Lansing, MI 48909
www.michigan.gov/bcc

Agency Use Only

Application Fee: $500.00

Authority: 1972 PA 230
Completion: Mandatory
Penalty: Use of material, product or method will not be approved

The Department of Labor and Economic Growth will not discriminate against any individual or group because of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. If you need help with reading, writing, hearing, etc., under the Americans with Disabilities Act, you may make your needs known to this agency.

PRODUCT INFORMATION

NATURE OF APPLICATION

☑ Material ☐ Product ☐ Method of Manufacture or Construction ☐ Component

CODE UNDER WHICH APPROVAL IS SOUGHT

☐ Building (140) ☐ Electrical (115) ☑ Mechanical (130) ☐ Plumbing (98)

NAME OF MATERIAL, PRODUCT OR METHOD OF MANUFACTURE (Limit To One Item Per Application)

gasFlex

OTHER IDENTIFICATION (Model Number)

Pipe and fittings :Sizes 1216 (1/2"), 1418 (Super 1/2") 1620 (5/8") 2025 (3/4") 2632 (1")

DESCRIPTION (Use Additional Sheets If Necessary)

Aluminum pipe tubing coextruded with a tough and seamless PE jacket inside and outside www.gasflex.com

INTENDED USE (Use Additional Sheets If Necessary)

Flexible tubing for Interior and underground gas piping systems (LPG and NATURAL GAS), intended for use in behind the wall applications, basement or underground or embedded in concrete or mortar

DATA SUBMITTED

☑ Letter
☐ Manual
☑ Standards
☐ Installation Instructions
☐ Display Catalog

Reports
☐ ICC - NES
☐ BOCA - NES
☐ ICBO
☐ SBCC
☐ NRB
☑ Other

☐ Product Sample or Model
☑ Prior Approvals by Other Agencies
☐ Recommendations by Model Code Bodies

LABORATORY TEST BY

SAI GLOBAL , SGS (Swiss Certification Services)

PILOT SERVICE EXPERIENCE AND CONDITIONS (Use Additional Sheets If Necessary)

Used in Australia for over 10 years, this technology has been used in America for the past 4 years, it is a flexible alternative in the way gas is installed in America . The gasFlex (R) Flexible Gas Piping System, is a complete piping system internationally certified by SGS. Aluminum tubing is listed for gas use in NFPA 54 National Fuel Gas Code.

RESTRICTIONS FOR USE (Use Additional Sheets If Necessary)

If used outdoors and exposed to direct sunlight it shall be inserted inside a floppy conduit or mechanical raceway or other scheme to protect it from direct sunlight.

APPLICANT (Note: All correspondence will be sent to this address)

NAME OF COMPANY	APPLICANT NAME
ExcelAmerica LLC	CAMILO MEJIA

ADDRESS: 8306 NW 56th St

CITY	STATE	ZIP CODE	TELEPHONE NUMBER (Include Area Code)
Miami	FLORIDA	33166	(305) 851-3223

APPLICANT SIGNATURE (Must be an original signature)	DATE	FAX NUMBER (Include Area Code)
		(206) 495-0816

Foshan , PRC November 2006

FOSHAN RIFENG ENTERPRISE CO., LTD.
HUABAO ROAD
ZHANGCHA WEST CITY DEVELOPMENT DISTRICT
FOSHAN, GUANGDONG 528000
CHINA

CERTIFICATION

We hereby certify that Excelamerica LLC is the distributor of the Type C Pipe PE AL PE Piping system for sale with the brand name "gasFlex" * and listed as *Rifeng PEX-AL-PEX* in SGS Product certificate # 785424 in compliance with AS 4176 --

ExcelAmerica LLC officers will provide the necessary training , samples and code related documentation to succesfully introduce this flexible gas piping solution for use in residential and commercial construction.

Long term hydrostatic strength curve testing has been performed per Appendix E of AS 4176 with satisfactory results when subjected to regression analysis by the method of least squares to give an extrapolated 97.5% LCL , the extrapolated times are not less than 438 000 h.

Best Regards,

Joyce Mo

Joyce Mo
Regional Sales Manager

Certified Product
Australian Standard

STANDARDSMARK LICENCE

SAI Global hereby grants to:

Foshan Rifeng Enterprise Co. Ltd

Rifeng Building 16 Zumiao Road Foshan Guangdong 528000 CHINA

"the Licensee" the right to use the STANDARDSMARK *as shown above only in respect of the goods described and detailed in the Schedule which are produced by the Licensee and which comply with the appropriate Standard referred to below as from time to time amended. The Licence is granted subject to the rules governing the use of the* STANDARDSMARK *and the Terms and Conditions for certification and licence. The Licensee covenants to comply with all the Rules and Terms and Conditions.*

Manufactured to:

AS 4176 – Polyethylene/aluminium and cross-linked polyethylene/aluminium macro-composite pipe systems for pressure applications

The STANDARDSMARK is a registered certification trademark of SAI Global Limited (A.C.N. 050 644 642) and is issued under licence by SAI Global Certification Services Pty Limited (ACN 108 716 669) ("SAI Global"). This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. Refer to the Schedule for the list of product models.

Licence No.: SMK02564
Issue Date: 14 March 2006

Certified Date: 14 March 2006
Expiry Date: 13 March 2011

Alex Ezrakhovich - General Manager Certification
For and on behalf of SAI Global

Authorised Local Signatory, SAI Global

MKP 128.0; CDAN 04/128 HMABLAZE 101891/18

SAI GLOBAL

SAI Global standards assurance innovation

JAS-ANZ

IQNet MEMBER

To verify that this certificate is current please refer to the SAI Global On-Line Certification Register: http://register.sai-global.com

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

DATE: September 4, 2008 M-08-19

TO: Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Approval of Product

The items listed below have been reviewed by Mechanical Division staff.

The manufacturers, the products, and the recommendations of the Mechanical Division for approval or disapproval of the items for installation in the State of Michigan are as follows:

Manufacture:	Omega Flex
Product:	Counter Strike
Description:	Flexible gas piping with the black protective sleeve. This product requires no additional bonding requirements for Counterstrike date coded 0731 and higher imposed by the manufacturer's installation instructions. Improved Counterstrike is to be bonded in accordance with the National Fuel Gas Code and the National Electrical Code NFPA 70 Article 250.104.
Test Results:	CSA International
Recommendation:	Approval recommended for installation in the State of Michigan for the following reason(s).

1. Must be installed to the Michigan Mechanical Code.
2. Must be installed to the International Fuel Gas code

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

September 2, 2008

Mr. Art Weirauch
OmegaFlex, Inc.
451 Creamery Way
Exton, PA 29341-2509

Dear Mr. Weirauch:

On September 17, 2008, the Board of Mechanical Rules will consider your application for Approval of a Product, OmegaFlex CounterStrike Gas Piping.

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

RECEIVED

AUG 08 2008

Petition Application for Approval of Material, Product or Method

Michigan Department of Labor & Economic Growth
Bureau of Construction Codes
P.O. Box 30255, Lansing, MI 48909
www.michigan.gov/bcc

Tran Info:130 14207704-1 08/06/08
Chk#: 170074 Amt: $500.00
ID: OMEGAFLEX INC

Agency Use Only

Application Fee: $500.00

Authority: 1972 PA 230 Completion: Mandatory Penalty: Use of material, product or method will not be approved	The Department of Labor and Economic Growth will not discriminate against any individual or group because of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. If you need help with reading, writing, hearing, etc., under the Americans with Disabilities Act, you may make your needs known to this agency.

PRODUCT INFORMATION

NATURE OF APPLICATION

☑ Material ☐ Product ☐ Method of Manufacture or Construction ☐ Component

CODE UNDER WHICH APPROVAL IS SOUGHT

☐ Building (140) ☐ Electrical (115) ☑ Mechanical (130) ☐ Plumbing (98)

NAME OF MATERIAL, PRODUCT OR METHOD OF MANUFACTURE (Limit To One Item Per Application)

TracPipe® CounterStrike®

OTHER IDENTIFICATION (Model Number)

FGP-CS-Size

DESCRIPTION (Use Additional Sheets If Necessary)

See Attached

INTENDED USE (Use Additional Sheets If Necessary)

Interior Fuel Gas piping Systems as referenced in IFGC 2006: 403.5.4 / NFPA 54 2006: 5.6.3.4

DATA SUBMITTED

☐ Letter
☑ Manual
☐ Standards
☑ Installation Instructions
☑ Display Catalog

Reports
☐ ICC - NES
☐ BOCA - NES
☐ ICBO
☐ SBCC
☐ NRB
☑ Other

☑ Product Sample or Model
☐ Prior Approvals by Other Agencies
☐ Recommendations by Model Code Bodies

LABORATORY TEST BY

CSA International

PILOT SERVICE EXPERIENCE AND CONDITIONS (Use Additional Sheets If Necessary)

RESTRICTIONS FOR USE (Use Additional Sheets If Necessary)

APPLICANT (Note: All correspondence will be sent to this address)

NAME OF COMPANY	APPLICANT NAME
OmegaFlex	Art Weirauch

ADDRESS: 451 Creamery Way

CITY	STATE	ZIP CODE	TELEPHONE NUMBER (Include Area Code)
Exton	PA	19341	(610) 524-7272

APPLICANT SIGNATURE (Must be an original signature)	DATE	FAX NUMBER (Include Area Code)
A. Weirauch	7-18-08	(610) 524-9771

Description:

CounterStrike® CSST with the black, protective sleeve uses the same, easy to install, ***AutoFlare®*** *fittings as conventional TracPipe® with the yellow jacket. CounterStrike® systems are sized in the same manner as TracPipe® either using Capacity Tables or other approved methods.*

There are no additional bonding requirements for CounterStrike date coded 0731 and higher imposed by the manufacturer's installation instructions. Improved Counterstrike is to be bonded in accordance with the National Fuel Gas Code NFPA 70 Article 250.104, the National Fuel Gas Code NFPA 54, and with any local requirements which may be in excess of the national codes.

TracPipe®
Flexible Gas Piping by Omega Flex

ISO 9001:2000
QMI REGISTERED

July 30, 2008

Michigan Department of Labor and Economic Growth
Bureau of Construction Codes – Mechanical Division
2501 Woodlake Circle
Okemos, MI 48864

Ref: Petition Application for Product Approval
OmegaFlex CounterStrike® Gas Piping

To whom it may concern,

Please find enclosed our application and fee requesting approval for our CounterStrike Corrugated Stainless Steel Tubing (CSST) product. CounterStrike has been tested, and certified to meet all applicable requirements of the Michigan Mechanical and Plumbing Codes (International Fuel Gas Code (IFGC) 2006.

In support of this product, please find the following enclosed items:

- CounterStrike Product Brochure
- CSA International Certificate of Compliance No. 1082441 (112221) for product approval to the requirements of the ANSI LC1/CSA 6.26 standard as required by Section 403.5.4 of the International Fuel Gas Code (IFGC) 2006.
- TracPipe Design Guide and Installation Instructions December 2007 – Section 4.10A.

Please advise the date of the committee's meeting so that we may make arrangements to have a representative present for any questions.

If you have any questions on this matter, please feel free to contact me.

Regards,

Art Weirauch
Manager – Training and Applications Engineering
OmegaFlex, Inc.
451 Creamery Way
Exton, PA 19341-2509
Tel: 610-524-7272 ext. 3014

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

DATE: September 4, 2008 M-08-20

TO: Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Approval of Product

The items listed below have been reviewed by Mechanical Division staff.

The manufacturers, the products, and the recommendations of the Mechanical Division for approval or disapproval of the items for installation in the State of Michigan are as follows:

Manufacture:	Omega Flex
Product:	Omega Flex Trac PS II
Description:	Flexible gas piping which incorporates an internally ribbed sleeve (conduit), and specially designed end fittings that provide vent capability at either end of a piping run in the event of a leak in the CSST.
Test Results:	CSA International / IAPMO
Recommendation:	Approval **not** recommended for installation in the State of Michigan for the following reason(s).

1. Product does not comply with section 404.11 of the 2006 International Fuel Gas Code for installation underground beneath buildings.

BUREAU OF CONSTRUCTION CODES
P.O. BOX 30254 • LANSING, MICHIGAN 48909
Telephone (517) 241-9325 • Fax (517) 241-9308
www.michigan.gov/dleg

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

September 2, 2008

Mr. Joe McGinnis
OmegaFlex, Inc.
451 Creamery Way
Exton, PA 29341-2509

Dear Mr. McGinnis:

On September 17, 2008, the Board of Mechanical Rules will consider your application for Approval of a Product, TracPipe PS-II

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

RECEIVED

AUG 0 8 2008

Petition Application for Approval of Material, Product or Method

Michigan Department of Labor & Economic Growth
Bureau of Construction Codes
P.O. Box 30255, Lansing, MI 48909
www.michigan.gov/bcc

Tran Info:130 14207702-1 08/06/08
Chk#: 170075 Amt: $500.00
ID: OMEGAFLEX INC

Agency Use Only

Application Fee: $500.00

Authority: 1972 PA 230
Completion: Mandatory
Penalty: Use of material, product or method will not be approved

The Department of Labor and Economic Growth will not discriminate against any individual or group because of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. If you need help with reading, writing, hearing, etc., under the Americans with Disabilities Act, you may make your needs known to this agency.

PRODUCT INFORMATION

NATURE OF APPLICATION

☑ Material ☐ Product ☐ Method of Manufacture or Construction ☐ Component

CODE UNDER WHICH APPROVAL IS SOUGHT

☐ Building (140) ☐ Electrical (115) ☑ Mechanical (130) ☐ Plumbing (98)

NAME OF MATERIAL, PRODUCT OR METHOD OF MANUFACTURE (Limit To One Item Per Application)

TracPipe PS-II

OTHER IDENTIFICATION (Model Number)

FGP-UGP-size

DESCRIPTION (Use Additional Sheets If Necessary)

See attachment: Description

INTENDED USE (Use Additional Sheets If Necessary)

TracPipe PS-II is a gas piping system suitable for above ground and underground use.

DATA SUBMITTED

☐ Letter
☑ Manual
☐ Standards
☐ Installation Instructions
☑ Display Catalog

Reports
☐ ICC - NES
☐ BOCA - NES
☐ ICBO
☐ SBCC
☐ NRB
☑ Other

☑ Product Sample or Model
☑ Prior Approvals by Other Agencies
☐ Recommendations by Model Code Bodies

LABORATORY TEST BY

CSA / IAPMO

PILOT SERVICE EXPERIENCE AND CONDITIONS (Use Additional Sheets If Necessary)

RESTRICTIONS FOR USE (Use Additional Sheets If Necessary)

Not for through wall penetrations. Does not meet ASTM E-84 requirements.

APPLICANT (Note: All correspondence will be sent to this address)

NAME OF COMPANY	APPLICANT NAME		
OmegaFlex	Art Weirauch		
ADDRESS			
451 Creamery Way			
CITY	STATE	ZIP CODE	TELEPHONE NUMBER (Include Area Code)
Exton	PA	19341	(610) 524-7272
APPLICANT SIGNATURE (Must be an original signature)		DATE	FAX NUMBER (Include Area Code)
			(610) 524-9771

TracPipe®
Flexible Gas Piping by Omega Flex

ISO 9001:2000

July 15, 2008

Michigan Department of Labor and Economic Growth
Bureau of Construction Codes – Mechanical Division
2501 Woodlake Circle
Okemos, MI 48864

Ref: Petition Application for Product Approval
OmegaFlex TracPipe PS-II Gas Piping

To whom it may concern,

Please find enclosed our application and fee requesting approval for our pre-sleeved Corrugated Stainless Steel Tubing (CSST) product – **TracPipe PS-II**. The TracPipe PS-II product has been designed, tested, and certified to meet all applicable requirements of the Michigan Mechanical and Plumbing Codes (International Fuel Gas Code (IFGC) 2006), specifically Section 404 of the IFGC 2006 including Section 404.11 for installation of gas piping underground beneath buildings.

In support of this product, please find the following enclosed items:

- TracPipe PS-II Product Brochure
- CSA International Certificate of Compliance No. 1082441 (112221) for product approval to the requirements of the ANSI LC1/CSA 6.26 standard as required by Section 403.5.4 of the International Fuel Gas Code (IFGC) 2006.
- International Association of Plumbing and Mechanical Officials (IAPMO) Listing for TracPipe PS-II. This listing states that the product has been evaluated and found acceptable for use underground and underground beneath building per the requirements of the Uniform Plumbing Code (UPC) and National Fuel Gas Code – NFPA 54.
- IAPMO Test Report No. 596-04001 which details the testing performed to obtain the IAPMO listing.
- Maximum super-imposed load data calculations demonstrating product's ability to withstand superimposed loads of soil.

OMEGAFLEX, Inc., 451 Creamery Way, Exton, PA 19341-2509
Voice: 800-671-8622 or 610-524-7272 • Fax: 610-524-7282 • www.omegaflex.com

ISO 9001:2000

- TracPipe Design Guide and Installation Instructions December 2007 – Ref. Section 4.9 – Underground Installations for TracPipe PS-II product information and Installation Instructions.

Please advise the date of the committee's meeting so that we may make arrangements to have a representative present for any questions.

If you have any questions on this matter, please feel free to contact me.

Regards,

Joe McGinnis
TracPipe FGP Commercial Project Engineer
OmegaFlex, Inc.
451 Creamery Way
Exton, PA 19341-2509
Tel: 610-524-7272 ext. 3031
800-671-8622
Fax: 610-524-7282
joe.mcginnis@omegaflex.net

TracPipe®
Flexible Gas Piping by Omega Flex

ISO 9001:2000
QMI REGISTERED

Description:

TracPipe PS-II is designed with our standard CSST tubing and incorporates an internally ribbed sleeve (conduit), and specially designed end fittings that provide vent capability at either end of a piping run in the event of a leak in the CSST. The venting capability fulfills code requirements for installations underground beneath buildings.

OMEGAFLEX, Inc., 451 Creamery Way, Exton, PA 19341-2509
Voice: 800-671-8622 or 610-524-7272 • Fax: 610-524-7282 • www.omegaflex.com

Pleune Service Co 750 Himes St. SE, Grand Rapids, MI 49548

FAX

Date: 6/26/08
Number of pages including cover sheet: 2

To:
Kevin Kalakay
State of Michigan
Re: Madison Academy
Phone:
Fax phone: 517-241-9308
CC:

From:
Sara Buettner
Sales Coordinator
Phone: 243-6374
Fax phone: 241-1757
E-Mail: sbuettner@pleuneservice.com

REMARKS: ☐ Urgent ☐ For your review ☒ Reply ASAP ☐ Please comment

Hi, Kevin –

Attached is information on TracPipe PS II for Madison Academy for your review.
Permit No. is: M361132.

RECEIVED
JUN 26 2008
By

CONFLICTS. 304.2 - PROVISIONS OF THE CODE SHALL APPLY

404.7 Above-ground outdoor piping. All piping installed outdoors shall be elevated not less than $3^1/_2$ inches (152 mm) above ground and where installed across roof surfaces, shall be elevated not less than $3^1/_2$ inches (152 mm) above the roof surface. Piping installed above ground, outdoors, and installed across the surface of roofs shall be securely supported and located where it will be protected from physical damage. Where passing through an outside wall, the piping shall also be protected against corrosion by coating or wrapping with an inert material. Where piping is encased in a protective pipe sleeve, the annular space between the piping and the sleeve shall be sealed.

404.8 Protection against corrosion. Metallic pipe or tubing exposed to corrosive action, such as soil condition or moisture, shall be protected in an approved manner. Zinc coatings (galvanizing) shall not be deemed adequate protection for gas piping underground. Ferrous metal exposed in exterior locations shall be protected from corrosion in a manner satisfactory to the code official. Where dissimilar metals are joined underground, an insulating coupling or fitting shall be used. Piping shall not be laid in contact with cinders.

404.8.1 Prohibited use. Uncoated threaded or socket welded joints shall not be used in piping in contact with soil or where internal or external crevice corrosion is known to occur.

404.8.2 Protective coatings and wrapping. Pipe protective coatings and wrappings shall be approved for the application and shall be factory applied.

Exception: Where installed in accordance with the manufacturer's installation instructions, field application of coatings and wrappings shall be permitted for pipe nipples, fittings and locations where the factory coating or wrapping has been damaged or necessarily removed at joints.

404.9 Minimum burial depth. Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade, except as provided for in Section 404.9.1.

404.9.1 Individual outside appliances. Individual lines to outside lights, grills or other appliances shall be installed a minimum of 8 inches (203 mm) below finished grade, provided that such installation is approved and is installed in locations not susceptible to physical damage.

404.10 Trenches. The trench shall be graded so that the pipe has a firm, substantially continuous bearing on the bottom of the trench.

404.11 Piping underground beneath buildings. Piping installed underground beneath buildings is prohibited except where the piping is encased in a conduit of wrought iron, plastic pipe, or steel pipe designed to withstand the superimposed loads. Such conduit shall extend into an occupiable portion of the building and, at the point where the conduit terminates in the building, the space between the conduit and the gas piping shall be sealed to prevent the possible entrance of any gas leakage. Where the end sealing is capable of withstanding the full pressure of the gas pipe, the conduit shall be designed for the same pressure as the pipe. Such conduit shall extend not less than 4 inches (102 mm) outside the building, shall be vented above grade to the outdoors, and shall be installed so as to prevent the entrance of water and insects. The conduit shall be protected from corrosion in accordance with Section 404.8.

404.12 Outlet closures. Gas outlets that do not connect to appliances shall be capped gas tight.

Exception: Listed and labeled flush-mounted-type quick-disconnect devices and listed and labeled gas convenience outlets shall be installed in accordance with the manufacturer's installation instructions.

404.13 Location of outlets. The unthreaded portion of piping outlets shall extend not less than 1 inch (25 mm) through finished ceilings and walls and where extending through floors or outdoor patios and slabs, shall not be less than 2 inches (51 mm) above them. The outlet fitting or piping shall be securely supported. Outlets shall not be placed behind doors. Outlets shall be located in the room or space where the appliance is installed.

Exception: Listed and labeled flush-mounted-type quick-disconnect devices and listed and labeled gas convenience outlets shall be installed in accordance with the manufacturer's installation instructions.

404.14 Plastic pipe. The installation of plastic pipe shall comply with Sections 404.14.1 through 404.14.3.

404.14.1 Limitations. Plastic pipe shall be installed outside underground only. Plastic pipe shall not be used within or under any building or slab or be operated at pressures greater than 100 psig (689 kPa) for natural gas or 30 psig (207 kPa) for LP-gas.

Exceptions:

1. Plastic pipe shall be permitted to terminate above ground outside of buildings where installed in premanufactured anodeless risers or service head adapter risers that are installed in accordance with the manufacturer's installation instructions.
2. Plastic pipe shall be permitted to terminate with a wall head adapter within buildings where the plastic pipe is inserted in a piping material for fuel gas use in buildings.

404.14.2 Connections. Connections made outside and underground between metallic and plastic piping shall be made only with transition fittings categorized as Category I in accordance with ASTM D 2513.

404.14.3 Tracer. A yellow insulated copper tracer wire or other approved conductor shall be installed adjacent to underground nonmetallic piping. Access shall be provided to the tracer wire or the tracer wire shall terminate above ground at each end of the nonmetallic piping. The tracer wire size shall not be less than 18 AWG and the insulation type shall be suitable for direct burial.

404.15 Prohibited devices. A device shall not be placed inside the piping or fittings that will reduce the cross-sectional area or otherwise obstruct the free flow of gas.

Exception: Approved gas filters.

404.16 Testing of piping. Before any system of piping is put in service or concealed, it shall be tested to ensure that it is gas

SEE DEFINITION — 4 PAGE

Minimum burial depth. Underground piping systems ›e installed a minimum depth of 12 inches (305 mm) below , except as provided for in Section 404.9.1.

e depth of 12 inches (305 mm) is considered suffi- ›nt to avoid possible harm to the pipe from the use of nd tools such as spades and shovels. However, if the ›ing is located in an area subject to surface loads ›ch as vehicular traffic, the 12-inch (305 mm) depth ay not be sufficient to protect the piping from those ads (see commentary Figure 404.9).

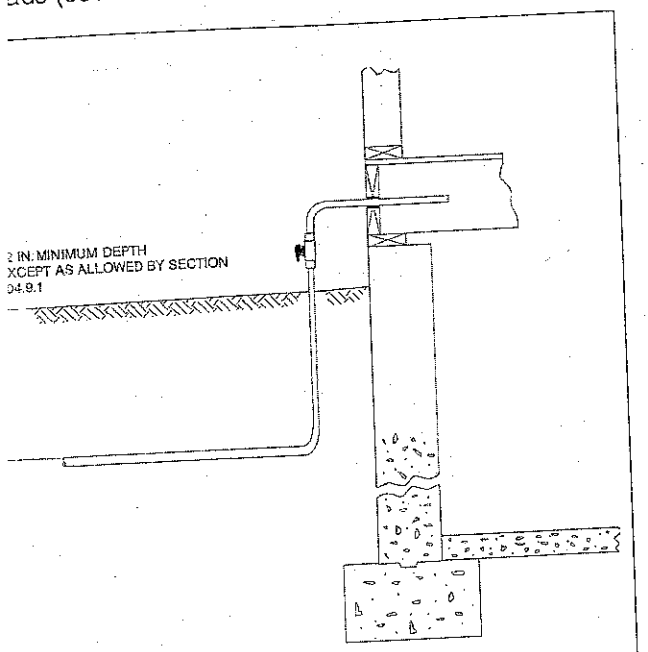

Figure 404.9
MINIMUM BURIAL DEPTH

4.9.1 Individual outside appliances. Individual lines to out- le lights, grills or other appliances shall be installed a mini- ım of 8 inches (203 mm) below finished grade, provided that ch installation is approved and is installed in locations not sus- ptible to physical damage.

Gas piping may be installed within 8 inches (203 mm) of the ground surface where it serves individual outdoor appliances and is not likely to be subjected to damage such as might occur from vehicular traffic, gardening, future excavation, etc. Each individual installation must be reviewed and approved by the code official. The intent is to allow shallow installations for small distribution lines that serve outdoor gas lights, cooking appliances, pool heaters and similar loads only where the piping is unlikely to be disturbed.

04.10 Trenches. The trench shall be graded so that the pipe has firm, substantially continuous bearing on the bottom of the rench.

❖ Where trenches have nonuniform depth or peaks and valleys in the bottom, the piping could lack continuous support and could be subjected to stresses from the backfill and surface loads.

404.11 Piping underground beneath buildings. Piping installed underground beneath buildings is prohibited except where the piping is encased in a conduit of wrought iron, plastic pipe, or steel pipe designed to withstand the superimposed loads. Such conduit shall extend into an occupiable portion of the building and, at the point where the conduit terminates in the building, the space between the conduit and the gas piping shall be sealed to prevent the possible entrance of any gas leakage. Where the end sealing is capable of withstanding the full pressure of the gas pipe, the conduit shall be designed for the same pressure as the pipe. Such conduit shall extend not less than 4 inches (102 mm) outside the building, shall be vented above grade to the outdoors, and shall be installed so as to prevent the entrance of water and insects. The conduit shall be protected from corrosion in accordance with Section 404.8.

❖ This section prohibits the installation of gas piping beneath buildings to reduce the potential for an inaccessible pipe failure caused by settling of the structure. The prohibition also reduces the potential for corrosion-caused failure of piping embedded in soil or fill. See Section 404.6 for gas pipe installations in floor slabs. Where underground installation under a building is unavoidable, the piping must be encased in another pipe to channel any leakage to the outdoors (see commentary Figure 404.11).

SEE NEXT PAGE

404.12 Outlet closures. Gas outlets that do not connect to appliances shall be capped gas tight.

Exception: Listed and labeled flush-mounted-type quick-disconnect devices and listed and labeled gas convenience outlets shall be installed in accordance with the manufacturer's installation instructions.

❖ Unused fuel gas outlets must be capped or plugged gas-tight, regardless of whether a shutoff valve is provided at the outlet. A closed valve alone is not dependable and poses an unnecessary risk of leakage. The exception recognizes that listed gas outlet devices are built with an inherent safety feature that will automatically shut off the gas flow if the mating connector is disengaged or that will not allow the appliance connector to be disengaged until the integral shutoff valve is manually closed.

404.13 Location of outlets. The unthreaded portion of piping outlets shall extend not less than 1 inch (25 mm) through finished ceilings and walls and where extending through floors or outdoor patios and slabs, shall not be less than 2 inches (51 mm) above them. The outlet fitting or piping shall be securely supported. Outlets shall not be placed behind doors. Outlets shall be located in the room or space where the appliance is installed.

Exception: Listed and labeled flush-mounted-type quick-disconnect devices and listed and labeled gas convenience outlets shall be installed in accordance with the manufacturer's installation instructions.

❖ This section regulates the location, installation and termination of gas piping system outlets to reduce the like-

FIGURE 404.11 - 404.14.1

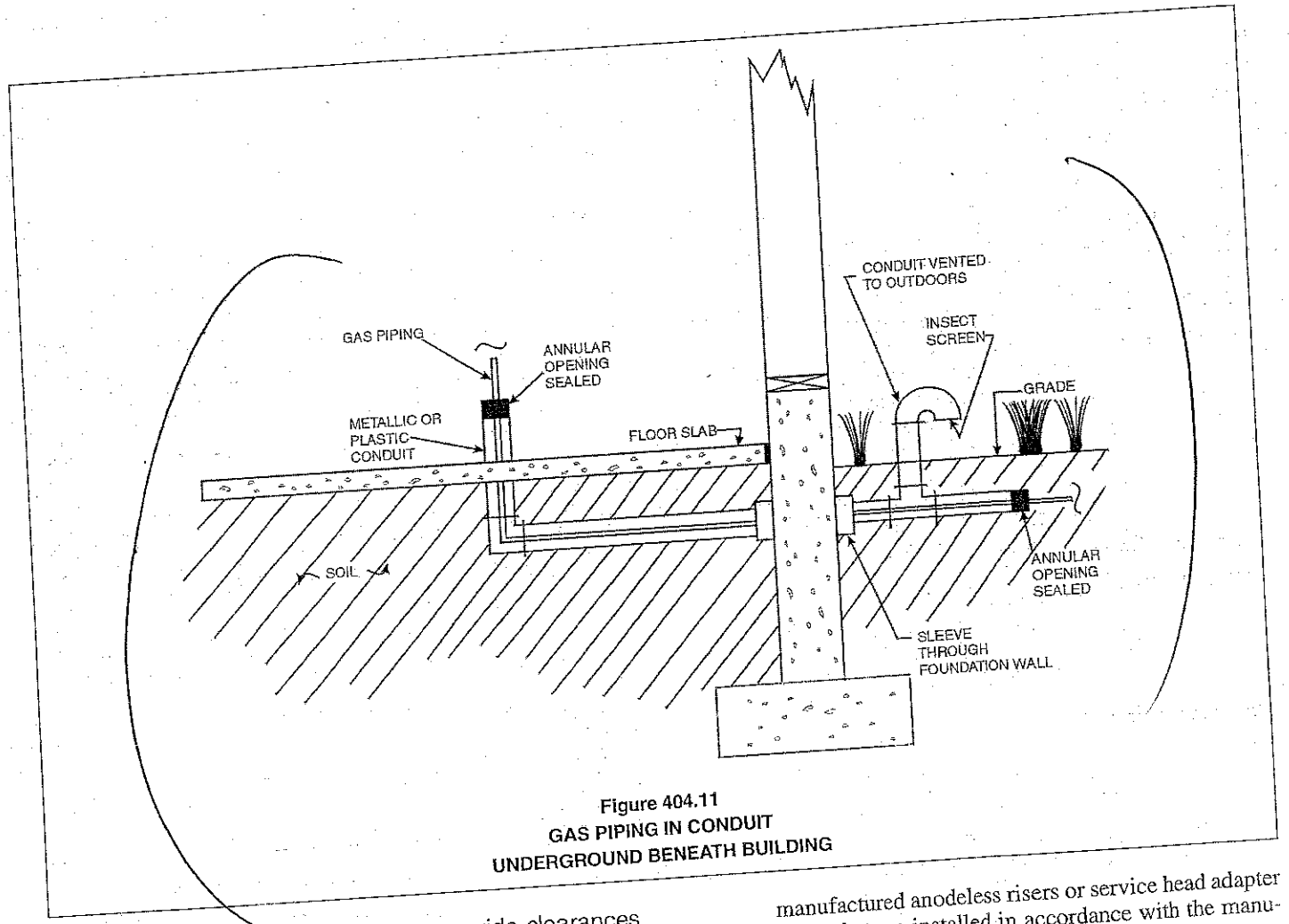

Figure 404.11
GAS PIPING IN CONDUIT UNDERGROUND BENEATH BUILDING

lihood of physical damage and to provide clearances for the use of tools. When making connections to piping outlets, "back-up" wrenches are used to prevent piping from rotating, loosening or being damaged. Sufficient pipe length is necessary to allow the application of tools. Gas outlet devices that have been tested and labeled for installation methods other than those addressed in this section must be installed in accordance with the terms of their testing and listing as contained in the manufacturer's installation instructions. Gas outlets for CSST systems must be installed with the termination fitting designed specifically for that purpose and provided by the CSST manufacturer.

404.14 Plastic pipe. The installation of plastic pipe shall comply with Sections 404.14.1 through 404.14.3.

❖ This section places restrictions on the location and operating pressures for plastic pipe in addition to stating installation requirements specific to plastic pipe.

404.14.1 Limitations. Plastic pipe shall be installed outside underground only. Plastic pipe shall not be used within or under any building or slab or be operated at pressures greater than 100 psig (689 kPa) for natural gas or 30 psig (207 kPa) for LP-gas.

Exceptions:

1. Plastic pipe shall be permitted to terminate above ground outside of buildings where installed in pre-manufactured anodeless risers or service head adapter risers that are installed in accordance with the manufacturer's installation instructions.
2. Plastic pipe shall be permitted to terminate with a wall head adapter within buildings where the plastic pipe is inserted in a piping material for fuel gas use in buildings.

❖ Because of the potential hazard associated with the use of a material that has lower resistance to physical damage and heat as compared to metallic pipe, installation of plastic pipe and tubing is limited to areas that are both outside of the building and underground. Plastic pipe and tubing are widely used for underground gas distribution systems because of their ease of installation and inherent resistance to corrosion. Polyethylene (PE) pipe is the only allowable plastic pipe for use with LP-gas, and the code user is directed to the reference standard, NFPA 58, which requires that PE piping materials comply with ASTM D 2513. The exception makes it clear that if an equivalent level of physical protection is installed, plastic pipe may terminate above ground outside of the building. It is common practice for gas utility companies to install pre-manufactured riser assemblies at their meter settings. Such risers typically consist of a steel pipe with a corrosion-resistant coating in which a length of PE pipe is pre-installed for coupling to the service lateral. A 90-degree (1.57 rad) sweep

DEFINITION OF PIPE

Pipe. A rigid conduit of iron, steel, copper, brass or plastic.

Tubing. Semirigid conduit of copper, aluminum, plastic or steel.

❖ Piping includes tubing and pipe used to convey fuel gases. See the definition for "Piping System."

PIPING SYSTEM. All fuel piping, valves and fittings from the outlet of the point of delivery to the outlets of the equipment shutoff valves.

❖ A piping system includes tubing, pipe, fittings, valves and line pressure regulators used to convey fuel gas from the point of delivery to the appliance. This definition was revised to state that the piping system ends at the outlets of the appliance shutoff valves. This revision allows the last 6 feet (1829 mm) or less of gas conduit between the shutoff valve and the appliance inlet connection to be sized as a connector (see Section 409.5 and the definition for "Point of delivery").

PLASTIC, THERMOPLASTIC. A plastic that is capable of being repeatedly softened by increase of temperature and hardened by decrease of temperature.

❖ Polyvinyl chloride (PVC) is a type of thermoplastic.

POINT OF DELIVERY. For natural gas systems, the point of delivery is the outlet of the service meter assembly, or the outlet of the service regulator or service shutoff valve where a meter is not provided. Where a valve is provided at the outlet of the service meter assembly, such valve shall be considered to be downstream of the point of delivery. For undiluted liquefied petroleum gas systems, the point of delivery shall be considered the outlet of the first-stage pressure regulator that provides utilization pressure, exclusive of line gas regulators, in the system.

❖ It is necessary to understand where the point of delivery begins with respect to fuel gas systems because that is the location where the enforcement of the *International Fuel Gas Code* begins. For LP applications, the point of delivery is the outlet of the second-stage regulator in low pressure systems or the first regulator that reduces pressure to 2 psi (13.8 kPa) or less in elevated pressure systems (see Figure 401.1). NFPA 58 regulates piping and components upstream of the second stage regulator. Any valve located on the outlet of the service meter assembly is considered part of the piping system under the scope of this code.

PORTABLE FUEL CELL APPLIANCE. A fuel cell generator of electricity, which is not fixed in place. A portable fuel cell appliance utilizes a cord and plug connection to a grid-isolated load and has an integral fuel supply.

❖ As stated in Section 101.2.4, Item 19, the code does not regulate these appliances because they do not connect to a fuel piping system and are completely self-contained.

PRESSURE DROP. The loss in pressure due to friction or obstruction in pipes, valves, fittings, regulators and burners.

❖ The pressure in a fuel gas system is reduced as the gas flows in the system. This is caused by a loss of energy resulting from friction and turbulence. Fuel gas systems are designed so that the pressure drop does not result in the system pressure falling below the minimum pressure required for proper equipment operation.

PRESSURE TEST. An operation performed to verify the gas-tight integrity of gas piping following its installation or modification.

❖ Installed piping systems are tested on the job site to verify that the system is free of leaks.

PURGE. To free a gas conduit of air or gas, or a mixture of gas and air.

❖ Piping systems are purged (flushed) to remove gaseous, liquid or solid contaminants that could be harmful to the piping contents, the piping system or the system components or that could create a fire or explosion hazard.

QUICK-DISCONNECT DEVICE. A hand-operated device that provides a means for connecting and disconnecting an appliance or an appliance connector to a gas supply and that is equipped with an automatic means to shut off the gas supply when the device is disconnected.

❖ These devices are commonly installed with gas appliance connectors and used with commercial cooking appliances and other gas appliances that are routinely moved for cleaning or used in another location [see commentary Figure 202(16)].

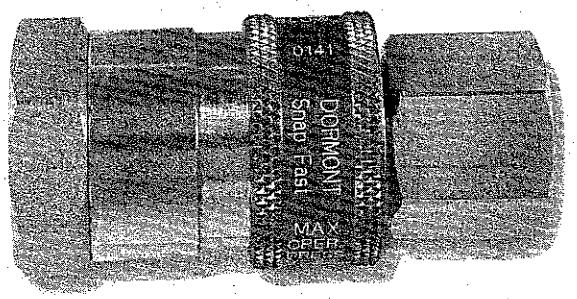

Photo courtesy of Dormont Manufacturing Company

Figure 202(16)
QUICK-DISCONNECT DEVICE

READY ACCESS (TO). That which enables a device, appliance or equipment to be directly reached, without requiring the removal or movement of any panel, door or similar obstruction (see "Access").

G. Underground and Under Building Slab Installations

TracPipe PS
Model Number(s) - FGP-UG-375 FGP-UG-500 FGP-UG-750
FGP-UG-100 FGP-UG-125 FGP-UG-150 FGP-UG-200

TracPipe PS-II
Model Number(s) - FGP-UGP-375 FGP-UGP-500 FGP-UGP-750
FGP-UGP-100 FGP-UGP-125 FGP-UGP-150 FGP-UGP-200

G.1 TracPipe underground and under building slab installations shall be made using pre-sleeved TracPipePS (patented) or TracPipePS-II (patent pending) systems or other sleeve configurations meeting code requirements and acceptable to the local administrative authority.

G.2 TracPipePS shall consist of TracPipe CSST sleeved with polyethylene conduit covering all portions of the gas piping system located underground. Heat-shrink tubing with heat-activated adhesive shall be used to seal off the space between the gas pipe and the protective sleeve. Heat shrink sleeve shall be DSG-Canusa Type CFW with thermoplastic adhesive liner or equal.

G.3 TracPipePS-II shall consist of TracPipe CSST sleeved with a black integral polyethylene sleeve. The external polyethylene sleeve shall be designed to withstand the superimposed loads. The external protective sleeve shall have internal vent channels lengthwise to direct any leakage along the pipe to the TracPipePS-II fittings. Fittings shall consist of AutoFlare fittings with a plastic containment coupling and ¼" NPT vent port, to seal off the space between the gas pipe and the protective sleeve.

G.4 For gas piping under building slabs, Plumbing, Mechanical and Fuel Gas Code requirements shall be followed for encasement within a conduit and venting to the atmosphere. (The construction of TracPipe PS and TracPipe PS-II provide the encasement and venting capabilities required by the codes.)

G.5 Flexible Poly Sleeve may be used. Part number FGP-UGFX-size is available for use with TracPipePS to facilitate 90-degree bends for the transition from below ground to above ground. Heat-shrink tubing and barbed couplings shall be used to make the transition from the polyethylene tubing to the flexible poly sleeve.

G.6 Underground couplings (part number FGP-UGC-size) may be used with TracPipePS-II system to facilitate splices underground. All metallic parts of the fitting shall be wrapped in a code-approved manner (*e.g.* mastic used for wrapping metallic pipe).

Superimposed Loading Chart

TracPipe PS/PS-II Size	3/8	1/2	3/4	1	1- 1/4	1-1/2	2
Max. Superimposed Loading *psf*	9640	7254	5409	4203	3390	2901	2124

Notes: 1. Super-imposed loading includes all dead load and live load combinations.
2. Maximum buried depth of 36" ; 3. Soil Density : 120 pcf; 4. Factor of safety used: 4.

Document #08-67e

MECHANICAL INSPECTORS

09/17/08 bmr
11/05/08 ccc

COOK, Frederick H.
Contractor's License #7109446 (1/1990)
Classifications 1, 2, 3, & 6
8,000+ hours HVAC
Additional Inspector
Leelanau County

MICHIGAN DEPARTMENT OF LABOR & ECONOMIC GROWTH
Schedule of Meetings/Hearings

2009

Bureau/Commission/Office: Bureau of Construction Codes	
Board/Council/Commission: Board of Mechanical Rules	
Address: 2501 Woodlake Circle	**Telephone:** (517) 241-9325
City: Okemos	**Michigan Zip Code:** 48864
Contact Person: Claudia Tenny	**Date:** August 14, 2008

The meeting site and parking is accessible. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional services (such as materials in alternative format) in order to participate in the meeting should call Claudia Tenny at 517/241-9325 at least 10 work days before the event. DLEG is an equal opportunity employer/program. The Division on Deafness will provide assistance in locating assistive listening devices or interpreters, with advance notice, at (517) 373-1837.

X	**Regular Meeting**		**Special Meeting**		**Rescheduled Meeting**

DATE	TIME	LOCATION
01-21-09	9:00 am	Conference Room No. 3, Okemos Building; Okemos, MI
03-18-09	9:00 am	Conference Room No. 3, Okemos Building; Okemos, MI
05-20-09	9:00 am	Conference Room No. 3, Okemos Building; Okemos, MI
07-15-09	9:00 am	Conference Room No. 3, Okemos Building; Okemos, MI
09-16-09	9:00 am	Conference Room No. 3, Okemos Building; Okemos, MI
11-12-09	9:00 am	Conference Room No. 3, Okemos Building; Okemos, MI

The above is provided pursuant to Sections 4 and 5 of Act 267 of Public Acts of 1976, being Sections 15.264 and 15.265 of the Michigan Compiled Laws.

Document #09-05e

MECHANICAL INSPECTORS

11/12/08 bmr
01/09/09 ccc

KENI, Jerrod N.
Contractor's License #7113584 (4/2001)
Classifications 1 & 2
8,000+ hours HVAC
Replacing Michael A. Grimes (Registration #003204)
Marquette County

ROBINETTE, Richard G.
Contractor's License #7104629 (1/1985)
Classifications 1, 2, 3, 4, 6, & 8
8,000+ hours HVAC
Additional Inspector
Gladwin County

SHERBURN, Rock L.
Contractor's License #7114117 (8/2002)
Classifications 3, 5, 7, & E
8,000+ hours HVAC
Additional Inspector
Antwerp Township – Van Buren County

TEAL, Jr., Richard J.
8,000+ hours HVAC
Additional Inspector
State of Michigan

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

November 3, 2008 **M-08-23**

TO: Members of the Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Appeal Request for Examination

APPLICANT REPRESENTATIVE:

Kevin Brocklebank

PROJECT:

Not applicable.

AUTHORITY:

The Forbes Mechanical Contractors Act, 1984 PA 192 of the Michigan Compiled Laws.

REQUEST:

Mr. Brocklebank is requesting to be allowed to sit for the mechanical contractor exam.

APPLICABLE RULE:

R 338.903a. of the Board of Mechanical Rules License Examination Procedures

FINDINGS:

Mr. Brocklebank worked for American Axle & Manufacturing from 6-6-1994 to 10-18-2004. His application indicates his work classification was HVAC. The job duties of the HVAC classification consist of HVAC equipment, refrigeration equipment, hydronic heating & cooling, process piping and natural gas forced air heating (up to 1 million Btu).

Although Mr. Brocklebank's employer indicated he has experience, we cannot accept this experience because American Axle & Manufacturing does not have a mechanical contractors license and the work performed in that location should be maintenance work.

RECOMMENDATION:

Based on the fact that Mr. Brocklebank does not have the experience as required by Act 192 it is the recommendation of staff to deny this request.

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

November 5, 2008

Mr. Kevin Brocklebank
726 Cleveland Ave.
Lincoln Park, MI 48146

Dear Mr. Brockelbank:

On November 12, 2008, the Board of Mechanical Rules will hear your appeal of the denial by staff for the Mechanical Contractor Licensing Examination.

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

November 3, 2008 **M-08-24**

TO: Members of the Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Appeal Request for Examination

APPLICANT REPRESENTATIVE:

Donald M. Scott

PROJECT:

Not applicable.

AUTHORITY:

The Forbes Mechanical Contractors Act, 1984 PA 192 of the Michigan Compiled Laws.

REQUEST:

Mr. Scott is requesting to be allowed to sit for the mechanical contractor exam.

APPLICABLE RULE:

R 338.903a. of the Board of Mechanical Rules License Examination Procedures

FINDINGS:

Mr. Scott submitted an application that was signed by Mr. Tony Robertson who has a mechanical contractor's license 71-15282 which is annotated HVAC. Mr. Scott is applying to take the Refrigeration exam. Mr. Robertson has a license from Arizona which is classified as Air Conditioning and Refrigeration. A review of the information received regarding the Arizona license indicates that to qualify to take that exam he needed to verify 4 years trade experience.

Although he was required to verify trade experience we have no way to determine just what they consider trade experience.

RECOMMENDATION:

Although it is evident that Mr. Scott has worked for a company that is a licensed contractor in the State of Arizona it is not clear what the requirements are to obtain that license. Staff therefore is recommending denial based on the lack of experience as required by the Forbes Mechanical Contractors Act, 1984 PA 192 of the Michigan Compiled Laws.

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

November 5, 2008

Mr. Donald Scott
4040 Chisholm Rd.
Florence, AL 35630

Dear Mr. Scott:

On November 12, 2008, the Board of Mechanical Rules will hear your appeal of the denial by staff for the Mechanical Contractor Licensing Examination.

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

November 5, 2008

Mr. William Ward
1720 Windsor St.
Lansing, MI 48906

Dear Mr. Ward:

On November 12, 2008, the Board of Mechanical Rules will hear your appeal of the denial for the Mechanical Contractor Licensing Examination pursuant to the Former Offenders Act..

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

November 5, 2008

Mr. Jamison Kortas
Ecolab, Inc.
370 Wabasha Street, EUC 9
St. Paul, MN 55102

Dear Mr. Kortas:

On November 12, 2008, the Board of Mechanical Rules will consider your application for Approval of a Product, Vapor Vent.

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison Barry

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

RECEIVED
SEP 23 2008

Petition Application for Approval of Material, Product or Method

Michigan Department of Labor & Economic Growth
Bureau of Construction Codes
P.O. Box 30255, Lansing, MI 48909
www.michigan.gov/bcc

Agency Use Only

Application Fee: $500.00

Authority: 1972 PA 230 Completion: Mandatory Penalty: Use of material, product or method will not be approved	The Department of Labor and Economic Growth will not discriminate against any individual or group because of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. If you need help with reading, writing, hearing, etc., under the Americans with Disabilities Act, you may make your needs known to this agency.

PRODUCT INFORMATION

NATURE OF APPLICATION

☐ Material ☐ Product ☐ Method of Manufacture or Construction ☑ Component

CODE UNDER WHICH APPROVAL IS SOUGHT

☐ Building (140) ☐ Electrical (115) ☑ Mechanical (130) ☐ Plumbing (98)

NAME OF MATERIAL, PRODUCT OR METHOD OF MANUFACTURE (Limit To One Item Per Application)

Vapor Vent - Alternative dish machine ventilation per IMC 507.2.2 Type II Hood exception

OTHER IDENTIFICATION (Model Number)

Dishmachine model numbers ES-2000V, Inferno-V, Typhoon-V, Supra Q2020V, PA-1V. Model numbers have a suffix "V" denoting integral Vapor Vent steam removal system

DESCRIPTION (Use Additional Sheets If Necessary)

Integral steam condensation unit - Please see included data and video

INTENDED USE (Use Additional Sheets If Necessary)

To eliminate the need for a Type II hood to be installed above a commercial dish machine. The device is integral to the dish machine and is only installed at the point of machine manufacture.

DATA SUBMITTED

☐ Letter
☑ Manual
☑ Standards
☑ Installation Instructions
☐ Display Catalog

Reports
☐ ICC - NES
☐ BOCA - NES
☐ ICBO
☐ SBCC
☐ NRB
☐ Other

☐ Product Sample or Model
☑ Prior Approvals by Other Agencies
☐ Recommendations by Model Code Bodies

LABORATORY TEST BY

JB Engineering and Code Consulting, P.C.

PILOT SERVICE EXPERIENCE AND CONDITIONS (Use Additional Sheets If Necessary)

Vapor Vent is in use in more than 30 states in hundreds of restaurant kitchens

RESTRICTIONS FOR USE (Use Additional Sheets If Necessary)

APPLICANT (Note: All correspondence will be sent to this address)

NAME OF COMPANY	APPLICANT NAME		
Ecolab Inc.	Ecolab Inc. - Jamison Kortas		
ADDRESS			
370 Wabasha Street, EUC 9			
CITY	STATE	ZIP CODE	TELEPHONE NUMBER (Include Area Code)
Saint Paul	Minnesota	55102	(651) 293-2231
APPLICANT SIGNATURE (Must be an original signature)	DATE		FAX NUMBER (Include Area Code)
	9-11-08		(651) 225-3122

BCC-247 (Rev. 12/06) Front

Instructions for Petition Application for Approval of Material, Product or Method

Nature of Application: Check the appropriate box. A component is a preassembled unit of different materials or products that will be incorporated into a building.

Code Under Which Approval is Sought: Check all codes that apply. There may be requirements in 2 or more codes for the approval sought.

Name of Material, Product or Method of Manufacture: Provide the name of the material, product or method.

Other Identification: Provide the model numbers.

Description: Provide a description of the material, product, method or component.

Intended Use: Give a brief description of how the product is incorporated into a building or structure and its purpose.

Data Submitted: Check the appropriate boxes and submit the required number of copies as listed below:

Building Code - **3** copies
Electrical Code - **15** copies
Mechanical Code - **18** copies
Plumbing Code - **11** copies

Only one sample is to be submitted when practical.

Laboratory Test By: List all tests performed and provide copies as listed above.

Pilot Service Experience and Conditions: Provide report of finding as listed above.

Restrictions for Use: Identify any restrictions or conditions of use.

Applicant: Provide all information requested.

U.S. Postal Service
Michigan Dept. of Labor & Economic Growth
Bureau of Construction Codes
(Address to appropriate division-Electrical Division, Mechanical Division or Plumbing Division
Please address Building approvals to Plan Review Division)
P.O. Box 30255
7150 Harris Drive
Lansing, MI 48909

Courier Other Than U.S. Postal Service
Michigan Dept. of Labor & Economic Growth
Bureau of Construction Codes
(Address to appropriate division-Electrical Division, Mechanical Division or Plumbing Division
Please address Building approvals to Plan Review Division)
2501 Woodlake Circle
Okemos, MI 48864

Validation Area

Tran Info:130 14303529-1 09/22/08
Chk#: 40162746 Amt: $500.00
ID: ECOLAB INC

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

DATE: November 3, 2008 M-08-22

TO: Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Approval of Product

The items listed below have been reviewed by Mechanical Division staff.

The manufacturers, the products, and the recommendations of the Mechanical Division for approval or disapproval of the items for installation in the State of Michigan are as follows:

Manufacture:	Fondue Cooking Process (The Melting Pot Restaurants, Inc.)
Product:	Cooktek induction cooktop model MPD 1000, Mosshaim infrared cooktop model CVM-51100B, and Bon Chef pot.
Description:	Electric induction or infrared cooktops are permanently installed into dining room tables to provide a unique dining experience by "Fondue" heating and cooking. Customers experience a multi-course meal, which typically includes dipping various small items of food into cheese, oil or broth, and chocolate, with an intervening salad course during which the cooktop is turned off by the respective server and there is no heating or cooking. Throughout the dining experience, cooktops are controlled only by servers.
Test Results:	UL laboratories performed the EPA 202 test using Canola Oil and Vegetable Broth. In both test the results were in compliance with UL710B, section 17 and NFPA 96, 4.1.1.2 since the measured values of 1.02 mg/m3 for canola oil and 2.75 mg/m3 for vegetable broth were less than the 5mg/m3 limit.

Recommendation: Approval recommended for installation in the State of Michigan without a hood under the following conditions.

1. The additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system.

2. For the purpose of determining the floor area required to be ventilated, each individual appliance that is not required to be installed under a hood shall be considered as occupying not less than 100 square feet for determination of ventilation capacity, inclusive of ventilation capacity required prior to consideration of unhooded appliances.

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

November 5, 2008

Mr. Jay Walden
The Melting Pot Restaurants, Inc.
8810 Twin Lakes Blvd.
Tampa, FL 33614

Dear Mr. Walden:

On November 12, 2008, the Board of Mechanical Rules will consider your application for Approval of a Product, Fondue Cooking Process, model MPD 1000, CVM-51100B and Bon Chef pot.

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

The Melting Pot®

a fondue restaurant

Dip into something different.®

Jay Walden
Vice President – Construction and Design

Franchise Support Center
8810 Twin Lakes Blvd. | Tampa, FL 33614
813.881.0055 x 120 | Cell: 813.732.6905
Fax: 813.367.0081 | Jayw@meltingpot.com
www.MeltingPot .com

1. Petition Application for Approval
2. Narrative
3. Letter from UL of 9/15/08
4. UL Report 710B (Section 17)
5. 2006 MMC (section 507)
6. 2006 MMC (section 403.3)
7. 2004 NFPA 96 (section 4.1.1 through 4.1.1.2)
8. 2008 NFPA 96 (section 4.1.1 through 4.1.1.2)
9. 2007 Calif. Mech. Code (section 507.1.5 and 507.1.6)
10. Cut sheet for CookTek model MPD 1000 / Cut sheet for Mosshaim model CVM-5100B
11. Pace report

Petition Application for Approval of Material, Product or Method

Michigan Department of Labor & Economic Growth
Bureau of Construction Codes
P.O. Box 30255, Lansing, MI 48909
www.michigan.gov/bcc

Agency Use Only

Application Fee: $500.00

Authority: 1972 PA 230 Completion: Mandatory Penalty: Use of material, product or method will not be approved	The Department of Labor and Economic Growth will not discriminate against any individual or group because of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. If you need help with reading, writing, hearing, etc., under the Americans with Disabilities Act, you may make your needs known to this agency.

PRODUCT INFORMATION

NATURE OF APPLICATION

☐ Material ☑ Product ☐ Method of Manufacture or Construction ☐ Component

CODE UNDER WHICH APPROVAL IS SOUGHT

☐ Building (140) ☐ Electrical (115) ☑ Mechanical (130) ☐ Plumbing (98)

NAME OF MATERIAL, PRODUCT OR METHOD OF MANUFACTURE (Limit To One Item Per Application)

Fondue Cooking Process at restaurants operated in Michigan by local franchisees of The Melting Pot Restaurants, Inc.

OTHER IDENTIFICATION (Model Number)

Cooktek induction cooktop model MPD 1000, Mosshaim infrared cooktop model CVM-51100B, and Bon Chef pot.

DESCRIPTION (Use Additional Sheets If Necessary)

See attached supplementary pages.

INTENDED USE (Use Additional Sheets If Necessary)

See attached supplementary pages.

DATA SUBMITTED

☑ Letter
☐ Manual
☑ Standards
☐ Installation Instructions
☐ Display Catalog

Reports
☐ ICC - NES
☐ BOCA - NES
☐ ICBO
☐ SBCC
☐ NRB
☑ Other

☐ Product Sample or Model
☐ Prior Approvals by Other Agencies
☐ Recommendations by Model Code Bodies

LABORATORY TEST BY

Underwriters Laboratory - see attached letter report of 9/15/08. Earlier report by Pace Analytical Services also attached.

PILOT SERVICE EXPERIENCE AND CONDITIONS (Use Additional Sheets If Necessary)

See attached supplementary pages.

RESTRICTIONS FOR USE (Use Additional Sheets If Necessary)

Cooking and heating processes to be operated in accordance with proprietary Operating Manual of The Melting Pot Restaurants, Inc.

APPLICANT (Note: All correspondence will be sent to this address)

NAME OF COMPANY	APPLICANT NAME
The Melting Pot Restaurants, Inc.	Jay Walden

ADDRESS: 8810 Twin Lakes Blvd.

CITY	STATE	ZIP CODE	TELEPHONE NUMBER (Include Area Code)
Tampa	Florida	33614	(813) 425-6220

APPLICANT SIGNATURE (Must be an original signature)	DATE	FAX NUMBER (Include Area Code)
	10/03/08	(813) 367-0081

BCC-247 (Rev 12/06) Front

Product Approval Application for Michigan

Responses and other information to complete the application form submitted by:

The Melting Pot Restaurants, Inc.

Description:

Electric induction or infrared cooktops are permanently installed into dining room tables to provide a unique dining experience by "fondue" heating and cooking. Customers experience a multi-course meal, which typically includes dipping various small items of food into cheese, oil or broth, and chocolate, with an intervening salad course during which the cooktop is turned off by the respective server and there is no heating or cooking. Throughout the dining experience, cooktops are controlled only by servers.

Intended Use:

Fondue heating and cooking should be allowed in Melting Pot restaurants without requiring either Type I or Type II hoods, based on acceptable levels of emissions, ventilation air that meets other code requirements, and sufficient HVAC heating and cooling (including condensing) capacity.

Type I hoods are required by the Michigan Mechanical Code (MMC) in paragraph 507.2.1, for cooking processes that produce grease and smoke, such as occurs with griddles, fryers, broilers, ovens, ranges, and wok ranges. There is no smoke from fondue cooking because there is no combustion, and the pertinent question of "how much grease?" can be answered by MMC 2006 reference in paragraph 507.1 to NFPA 96-2004.

NFPA 96-2004 (and the more recent 2008 version) states in paragraphs, 4.1.1.1 and 4.1.1.2 that no exhaust system is required for cooking equipment if grease emissions do not exceed 5 mg/m^3 with a test airflow of 500 cfm. It is interesting to note that the 2007 California Mechanical Code has included these NFPA 96 provides in CMC paragraphs 507.1.5 and 507.1.6 (attached).

As summarized below (and attached as referenced reports), recent testing by Underwriters Laboratory and previous testing by Pace Analytical Services, Inc. confirm that grease emissions from the Melting Pot cooking process are significantly below the limit. Additionally, it should be recognized that the Melting Pot fondue heating and cooking process is significantly less intensive than with the appliances cited in MMC section 507.2.1. Accordingly, with the MMC referencing NFPA 96 2004, no exhaust system (either Type I or Type II) should be required.

Though it can concluded by MMC section 507.1 reference to NFPA 96 2004 that no exhaust system should be required, for completeness of discussion, it is noted that Type II hoods are required by the Michigan Mechanical Code in section 507.2.2, for cooking

processes that produce heat and steam and do not produce grease or smoke, such as steamers, kettles, pasta cooker, dishwashing machines, and ovens. Again, it should be recognized that the Melting Pot heating and cooking process is significantly less intensive than with the appliances cited in this paragraph of code, particularly based on the process by which very small items of food are sequentially cooked by Melting Pot customers over a long period of time.

Type II hood requirements in the International Mechanical Code, which is the template for local adoptions of mechanical codes, have undergone a significant evolution in the last few years. In the IMC 2003 version, the stated exceptions for Type II hood requirements were related to dishwashers only. In the IMC 2006 version, an additional exception was added, which includes a list of eight electrically heated appliances exceptions, by name (toasters, steam tables, popcorn poppers, hot dog cookers, coffee makers, rice cookers, egg cookers, holding/warming ovens), and then states that "additional heat and moisture loads generated by such appliances shall be accounted for in the design of the HVAC system." Several small types of electric appliances are not on the IMC 2006 list, and because the list would likely be continuously added to and revised, an IMC revision has recently been approved, which removes the list of appliances names, while retaining the HVAC design requirement. From an International Code Council summary of the 08/09 code revision cycle, the recently approved IMC paragraph 507.2.2 reads:

> **507.2.2. Type II hoods.** Type II hoods shall be installed above dishwashers and light-duty appliances that produce heat or moisture, except where the heat or moisture loads from such appliances are incorporated into the HVAC system design or into the design of a separate removal system. Type II hoods shall be installed above all light-duty appliances that produce products of combustion and do not produce grease or smoke. Spaces containing cooking appliances that do not require Type II hoods shall be ventilated in accordance with Section 403.3. For the purpose of determining the floor area required to be ventilated, each individual appliance that is not required to be installed under a Type II hood shall be considered as occupying not less than 100 square feet.

In preparing and submitting this revision, the Virginia code official and former IMC committee member indicated in his justification:

> "Over the past several code cycles the exception has long surpassed the rule of this section. This proposal attempts to correct this fundamental flaw in the IMC. The laundry list of exceptions keeps growing each year. Now that the list of items that do not require hoods has exceeded the list of what does, the format must change also. It is only proper, for clarity and ease of use; that the codes reflect the more correct approach to these type issues. The original small list of exceptions was created to provide some relief for counter top type appliances. But the terms counter top never made it into the code and since then the list just keeps expanding. Designers and installers alike are taking full advantage of the philosophy that they can compare just about any other light duty appliance to one on the list and assert 'similarity,' and most

localities are approving light duty appliances without the benefit of hoods. Before the 1996 IMC was introduced two of the three legacy codes never required Type II hoods. To date, no evidence has been produced that reflects any negative results found in the many existing installations of these type appliances without hoods."

In unanimously accepting this change "as submitted," the report of code adoption hearings indicates that the IMC committee reasoned:

> "Replacing the lists of appliances that do not require Type II hoods with this new language will allow more appliances to operate without hoods. Lists are never all-inclusive and this will allow new appliances that come on the market in the future to be operated without hoods."

The code revision for section 507.2.2 allows sufficient HVAC capacity as an alternative for exhaust systems for emissions of heat and steam. Accordingly, Type II hoods should not be required over electric induction or infrared cooktop operations in Melting Pot restaurants because sufficient capacity to remove heat and moisture will continue to be incorporated into the Melting Pot HVAC design, and Melting Pot restaurants will conform to the new code IMC paragraph 507.2.2 requirements. Further, to ensure design integrity and conformance, we have verified with the new section 507.2.2 proposing code official his intent with respect to application by Melting Pot.

Because application of the new section 507.2.2 requirements may result in greater fresh air and building exhaust requirements than otherwise required by section 403.3, and because Melting Pot endeavors to provide sustainable ("green") building designs, Melting Pot will continue to include energy recovery ventilators or equivalent equipment to minimize heating and cooling of fresh air.

Additionally, because neither Type I nor Type II exhaust systems would be required by this Product Approval, the restrictions of mechanical code section 5.14.2 would not apply, and building air would be allowed to exit through one or more energy recovery ventilators, which would result in significant reduction of added fresh air heating and cooling energy, on the order of 60–70%.

Laboratory Test By:

1. Underwriters Laboratory (UL) conducted testing as specified by UL standard 710B, section 17 (as referenced by UL 197) and NFPA standard 96 paragraph 4.1.1.2 on August 27-28, 2008. UL 710B requires emissions less than 5 mg/m^3, and NFP96 (2004 and 2008 editions) states that an exhaust system is not required if grease emissions are less than 5 mg/m^3 when measured at 500 cfm. The UL testing realistically simulated cooking in a Melting Pot restaurant by using the induction cooker, cooking fluids, cooking pot, and food items specified and provided by the Melting Pot Restaurants, Inc. As sampled and analyzed by the rigorous test method of EPA 202, the average grease emission result from cooking with canola oil was 1.02 mg/m^3, and the result from cooking with broth was 2.75 mg/m^3 – both less than the limit. Additionally, UL reported that in both sets of

tests, "no visible smoke was emitted," and "no noticeable amount of smoke accumulated in the test room after 8 hours of continuous cooking."

2. A similar test was performed in 2002 by Pace Analytical Services, Inc. The Pace testing was conducted to fulfill a City of Irvine, California requirement that the concentration of emissions be less than 5 mg/cm^3, when cooking meat with oil in simulated restaurant conditions. This laboratory test was designed to exceed "worst case conditions," and it was conducted prior to the specification of testing at 500 cfm. Instead, airflow above the cooktop was provided by natural, buoyant convection from oil heated by the cooktop. Three independent tests yielded values of 1.6, 1.3, and 1.2 mg/cm^3, with an average of 1.4 mg/cm^3, per EPA method 202. It is significant to note this test with natural convection of emissions yielded results nearly identical to the UL test under a test hood set for 500 cfm airflow, which substantiates the accuracy of testing by two independent laboratories. Based on the PACE testing, no hoods were required in the Irvine restaurant, and jurisdictions reviewing these results for subsequent permitting (with the exception of Ann Arbor) have not required hoods in Melting Pot restaurants.

Pilot Service Experience and Conditions:

Cooktops (both electric induction and infrared) have been used in over 135 Melting Pot restaurants during the past 35 years with emission and environmental results acceptable to local building code officials, customers, and employees. The small concentration of grease laden vapors released by cooking is removed by normal fresh air supply and exhaust provided by HVAC systems, in accordance with codes that generally require 20 cfm per occupant supply to and exhaust from the building. Heat and water vapor released from heating cheese and chocolate courses or cooking in oil or water-based broth, is accommodated by cooling and condensation of respective sensible and latent loads. In some newer restaurants, where possible, energy recovery ventilators are part of the Melting Pot Restaurants' HVAC sustainable ("green") design practice, in order to minimize heating and cooling of the fresh air supply in an energy-conservative manner.

Underwriters Laboratories Inc.®

Northbrook Division
333 Pfingsten Road
Northbrook, IL 60062-2096 USA
www.ul.com
tel: 1 847 272 8800
fax: 1 847 272 8129
Customer service: 1 877 854 3577

9/15/2008

Mr. Jay Walden
Melting Pot Restaurants Inc
8810 Twin Lakes Blvd
Tampa FL, 33614
United States

Our Reference: File E322840 Project 08CA42515

Subject: EPA 202 TEST METHOD: USING A COOKTEK INDUCTION COOKER WITH A MEDIA OF CANOLA OIL AND VEGETABLE BROTH.

Dear Mr. Walden:

Per your request, project 08CA42515 was opened for the evaluation of grease-laden vapors produced from cooking food product in a pot with Canola oil and vegetable broth using a CookTek model MPD1000 induction cooker. The scope of the project was to determine the grease emissions from the cooking process of both Canola oil and vegetable broth using the CookTek induction cooker in accordance with EPA Method 202 test guidelines to demonstrate compliance with UL710B, the Standard for Recirculating Systems, Sec. 17 and NFPA96, the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, paragraph 4.1.1.2. The test was conducted at our facility in Northbrook, IL on August 27th and 28th, 2008. This letter will report the results of the EPA202 test.

For the record, the test was conducted using a pear-shaped pot with the top opening of the pot measuring 6 inches in diameter with maximum capacity of 2-1/2 quarts on a CookTek model MPD1000 induction cooker with a mixture of Beef, Chicken, and Broccoli as specified by The Melting Pot as shown in Appendix A and B. The Pot was filled with 44 oz. of the intended liquid as described in Appendix A and B.

Please see the attached Appendix pages A and B for the test method and results of the test. The results are considered to comply with UL710B, Section 17 and NFPA96, paragraph 4.1.1.2 since the measured values of 1.02-mg/m^3 for canola oil and 2.75-mg/ m^3 for vegetable broth was less than the 5-mg/m^3 limit. No evaluation was conducted in regards to fire protection.

This letter will serve to report that all tests on the subject product have been completed with acceptable results. All information generated will be retained for future use. This concludes all work associated with Project 08CA42515 and we are therefore closing this project. Our Accounting Department has been instructed to bill you for all charges incurred.

Should you have any questions or comments concerning the above, please feel free to contact the undersigned.

Very truly yours,

William G. Morler

Reviewed by:

Fred Zaplatosch

William G. Morler
Project Engineer
3015CNBK
Tel: 847-664-1852
Fax: 847-407-1852
William.morler@us.ul.com

Fred Zaplatosch
Staff Engineer
3015CNBK

APPENDIX: A

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR: CANOLA OIL

The CookTek model MPD1000 induction cooker was tested using the method derived from EPA Method 202. The manufacturer also provided a food load mixture of Beef, Chicken, and Broccoli as noted below.

An 8 in. by 6 in. rectangular, 108 in. tall sheet metal stack was constructed on top of a sheet metal hood and mounted above the exhaust vent of the oven. A sampling port was located approximately 80 in. downstream from the hood exhaust, at which point it was determined there was laminar flow. The sampler was assembled and an out of stack filter was used. A pre-leak check was conducted and determined to be > 0.02 ft/min. Sampling was done at 8 traverse points.

The induction cooker was operated normally by cooking with the following foods in 44 oz. of Canola Oil:

One Complete Cycle (1 Hr)

Food	# of Individual Cycles	Cook Time min	oz. per Skewer	# of Skewers per Pot
Chicken	16	2	1/2	6
Beef	4	2	1/2	6
Broccoli	20	2	-	2

One complete cycle is made up of individual cycles within. There was a 60 second delay between individual cycles to allow for oil stabilization.

Individual Cycle

Food	# of Cycles	Cook Time Min	oz. per Skewer	# of Skewers	Total Skewer per pot
Chicken	4	2	1/2	6	8
Beef	1				
Broccoli	5		-	2	

The cooking cycle was repeated 8 times with 4 minute delay after every cycle to allow for the changing of oil.

During the cooking operation, it was noted whether or not visible effluents evolved from the air exhaust of the hood. Gauge, meter and temperature readings were taken and recorded every 10 min. After cooking, the condition of the duct was noted and a post-leak check was conducted and determined to be < 0.02 ft^3/min.

After being allowed to cool, the sampling equipment was disassembled; the filter was removed, and placed into a sample container labeled No. 1. The liquid in impingers Nos. 1, 2, and 3 were volumetrically measured and transferred to sample container No. 3. The silica gel and impinger No. 4 was transferred to sample container No. 5. The nozzle, probe and impingers were rinsed three times with water and the rinse was added to container No. 3. These parts were also rinsed three times with acetone and transferred to container No. 4. All additional inter surfaces of the sampling terrain glassware were rinsed with methylene chloride three times; the rinse was transferred to container No. 6. A blank of acetone approximately equivalent to the amount used for rinses was aliquoted into container No. 2, the same was done for the distilled de-ionized water and methylene chloride except that these were aliquoted into their own individual containers labeled No. 7 and 8 respectively. All containers were properly labeled and sealed, then the liquid levels in all the containers were marked.

The analysis phase was done in accordance with EPA Method 202, using the out of stack filter.

RESULTS: CANOLA OIL

There was no visible smoke was emitted from the exhaust of the hood during the normal cooking operation. There was no noticeable amount of smoke accumulated in the test room after 8 hours of continuous cooking.

The total amount of grease-laden effluents collected by the sampling equipment was found to be 1.02 mg/m^3, which is less than 5 mg/m^3.

APPENDIX: B

TEST FOR EVOLUTION OF SMOKE OR GREASE-LADEN AIR: VEGETABLE BROTH

The CookTek model MPD1000 induction cooker was tested using a method derived from EPA Method 202. The manufacturer also provided a food load mixture of Beef, Chicken, and Broccoli as noted below.

An 8 in. by 6 in. rectangular, 108 in. tall sheet metal stack was constructed on top of a sheet metal hood and mounted above the exhaust vent of the oven. A sampling port was located approximately 80 in. downstream from the hood exhaust, at which point it was determined there was laminar flow. The sampler was assembled and an out of stack filter was used. A pre-leak check was conducted and determined to be > 0.02 ft/min. Sampling was done at 8 traverse points.

The induction cooker was operated normally by cooking with the following foods in 44 oz. of Vegetable Broth:

One Complete Cycle (1 Hr)

Food	# of Cycles	Cook Time Min:sec	oz. per Skewer	# of Skewers per Pot
Chicken	16	2:45	1/2	6
Beef	4	2:45	1/2	6
Broccoli	20	2:45	-	2

One complete cycle is made up of individual cycles within. There was a 15 second delay between individual cycles to allow for broth stabilization. After every other individual cycle, the pot was topped off to 44oz and then a timed cycle.

Individual Cycle

Food	# of Cycles	Cook Time Min:sec	oz. per Skewer	# of Skewers	Total Skewer per pot
Chicken	4	2:45	1/2	6	8
Beef	1				
Broccoli	5		-	2	

The cooking cycle was repeated 8 times with 3 minute and 15 second delay after every cycle to allow for the changing of broth.

During the cooking operation, it was noted whether or not visible effluents evolved from the air exhaust of the hood. Gauge, meter and temperature readings were taken and recorded every 10 min. After cooking, the condition of the duct was noted and a post-leak check was conducted and determined to be < 0.02 ft^3/min.

After being allowed to cool, the sampling equipment was disassembled; the filter was removed, and placed into a sample container labeled No. 1. The liquid in impingers Nos. 1, 2, and 3 were volumetrically measured and transferred to sample container No. 3. The silica gel and impinger No. 4 was transferred to sample container No. 5. The nozzle, probe and impingers were rinsed three times with water and the rinse was added to container No. 3. These parts were also rinsed three times with acetone and transferred to container No. 4. All additional inter surfaces of the sampling terrain glassware were rinsed with methylene chloride three times; the rinse was transferred to container No. 6. A blank of acetone approximately equivalent to the amount used for rinses was aliquoted into container No. 2, the same was done for the distilled de-ionized water and methylene chloride except that these were aliquoted into their own individual containers labeled No. 7 and 8 respectively. All containers were properly labeled and sealed, then the liquid levels in all the containers were marked.

The analysis phase was done in accordance with EPA Method 202, using the out of stack filter.

RESULTS: VEGETALBE BROTH

There was no visible smoke was emitted from the exhaust of the hood during the normal cooking operation. There was no noticeable amount of smoke accumulated in the test room after 8 hours of continuous cooking.

The total amount of grease-laden effluents collected by the sampling equipment was found to be 2.75 mg/m^3, which is less than 5 mg/m^3.

16.5 During the test, there shall be no visible emission of smoke and grease-laden air from the air discharge port or any other part or joint in the hood assembly.

17 Emission Test

17.1 General

17.1.1 The tests described in 17.1.2 – 17.6.2 shall be conducted while the unit is operating at the lower air flow limit.

17.1.2 The type of product is to be meat cakes as specified in the Standard for Exhaust Hoods for Commercial Cooking Equipment, UL 710, for appliances such as griddles, broilers, and others intended to cook meat, or frozen, unbreaded fries for fryers, or specific products to be cooked by other appliances such as donut fryers. The amount of food product to be cooked shall be the maximum product capacity for the appliance.

17.1.3 Vegetable frying oil shall be used to cook the food load of a deep fat fryer.

17.1.4 The grease-laden effluent discharged at the exhaust outlet of the system shall be measured as described below which was derived from the U. S. Environmental Protection Agency (EPA) Test Method 202, Determination of Condensible Particulate Emissions From Stationary Sources.

17.1.5 The grease-laden effluent at the exhaust outlet of the system shall not exceed an average of 5.0 mg/m^3 of exhausted air sampled at a maximum product capacity over a continuous 8 hour test cooking period.

17.2 Test apparatus

17.2.1 The sampling train is to consist of the following:

a) A stainless steel probe nozzle with a sharp tapered leading edge. The size is to be suitable for isokinetic sampling.

b) A glass mat filter without an organic binder.

c) A stainless steel filter holder.

d) A glass or teflon lined probe extension equipped with a heating system.

e) A type S stainless steel pitot tube suitable for use with a manometer assembly.

f) A temperature sensor which is to be attached to either the pitot tube or to the probe extension.

17.2.2 A system of four impingers, in an ice bath, shall be connected to the probe extension. Both the first and second impingers shall be of the Greensburg-Smith design with the standard tip.

17.2.3 A meter system shall consist of a vacuum gauge, leak free pump, thermometers, and a dry gas meter.

17.2.4 A barometer shall be used to measure barometric pressure at the beginning of the test.

17.3 Sampling procedure

17.3.1 The preliminary set-up shall be constructed as follows:

a) Construct a stack out of duct sheet metal which is to be used for sampling.

b) Each of the first three impingers is to be filled with 100 ml deionized distilled water. The fourth impinger is to be filled with silica gel. The weight of each impinger is to be determined and recorded.

c) Assemble the train. The use of silicone grease is prohibited.

d) A pre-test leak check is to be conducted.

e) Calibrate the system.

17.3.2 The sampling location is to be located at least eight stack diameters downstream and two stack diameters upstream from any flow disturbance. After this criteria is met and a circular stack is used, a minimum of eight traverse points are to be used.

17.3.3 A post-test leak check is to be conducted.

17.4 Sample handling

17.4.1 The glass-filter is to be removed using a pair of forceps and placed in a clean petri dish. The dish is to be sealed and labeled "sample bottle number one".

17.4.2 A sample of the acetone of the same volume that will be used to rinse-out the nozzle and probe is to be placed into a clean sample bottle, sealed, and labeled "sample bottle number two". The level of the liquid in the sample bottle is to be recorded.

17.4.3 The inside of the nozzle and probe is to be rinsed with acetone taking care to collect all the rinse material in a clean sample bottle. The sample bottle is to be sealed, labeled "sample bottle number three", and the level of the liquid in the bottle is to be recorded.

17.4.4 The liquid in the first three impingers is to be measured and the total volume is to be recorded which will be compared to the original volume. The liquid is to be quantitatively transferred to a clean sample bottle.

17.4.5 Each impinger and the connecting glassware including the probe extension is to be rinsed twice with water. The rinse water is to be collected and added to the same sample bottle. The sample bottle is to be sealed, labeled "sample bottle number four," and the level of the liquid in the bottle is to be recorded.

17.4.6 The rinses described in 17.4.5 is to be followed with two rinses of methylene chloride ($MeCl_2$). The rinses are to be recovered in a clean sample bottle. The sample bottle is to be sealed, labeled "sample bottle number five" and the level of the liquid in the bottle is to be recorded.

17.4.7 A volume of water approximately equivalent to the volume of water used in 17.4.5 and a volume of $MeCl_2$ approximately equivalent to the volume of $MeCl_2$ used in 17.4.6 is to be placed in two clean sample bottles. The sample bottles are to be sealed, labeled "sample bottle number six" and "sample bottle number seven" respectively, and the level of the liquid in the bottles is to be recorded.

17.4.8 The fourth impinger containing the silica gel is to be emptied into a capped, sealed sample bottle and labeled "sample bottle number eight".

17.5 Analysis

17.5.1 The liquid level of all the sample bottles is to be measured.

17.5.2 The filter from sample bottle number one is to be removed and dried to constant weight by means of a desiccator or an oven. The weight of the filter is to be recorded.

17.5.3 The volume of sample bottle number two is to be determined. The liquid is then to be transferred to a beaker and evaporated to dryness. The volume of the liquid and the final weight of the condensable matter are to be recorded.

17.5.4 The volume of sample bottle number three is to be determined. The liquid is then to be transferred to a beaker and evaporated to dryness. The volume of the liquid and the final weight of the condensable matter are to be recorded.

17.5.5 The volumes of sample bottles number four and five are to be measured.

17.5.6 Sample bottles number four and five are to be combined. The organic phase is to be mixed, separated, and then repeated with two $MeCl_2$ washes.

17.5.7 The organic extracts obtained from the procedure in 17.5.6 are to be placed in a beaker and evaporated to a constant weight. The final weight is to be recorded.

17.5.8 The inorganic phase is to be placed in a beaker and evaporated to dryness. The final weight is to be recorded.

17.5.9 The volumes of sample bottles number six and seven are to be determined. Sample bottles six and seven are to be analyzed according to 17.5.8 and 17.5.7 respectively.

17.5.10 The weight of sample bottle number eight (impinger and silica gel) is to be recorded.

17.6 Results

17.6.1 The average captured condensible particulate matter shall not exceed 3.1×10^{-7} lb/ft^3 (5.0 mg/m^3).

17.6.2 During the test, temperatures of the air flow and of various surfaces considered to be thermally hot during the cooking operation are to be measured. These temperatures shall not exceed 475°F (246°C).

17.6.3 Tests conducted on pressure fryers shall include operation of the sample in an open fryer mode with the access door remaining open during the test. If normal operation of the product in a pressure operating mode indicates this mode to be worse case in terms of visible emission, the test shall be conducted in both modes of operation.

18 Damper Closure Tests

18.1 With the unit operating at its maximum air flow and the damper's actuating device disabled, the damper is to be manually operated. The damper shall fully close as intended. This operation is to be conducted a total of three times.

19 Automatic Operation Fire Test

19.1 When tested as specified in 19.2 – 19.6, the extinguishing system unit shall detect and suppress the fire. The sample is to be monitored after actuation in accordance with the requirements in the Standard for Fire Testing of Fire Extinguishing Systems for Protection of Restaurant Cooking Areas, UL 300, to verify that re-ignition does not occur. When tested in accordance with 19.5, the extinguishing system unit shall comply with the extinguishment splash test and the cooking temperature splash test as specified in UL 300.

19.2 If a fryer employs a removable cover that is used while the heater is energized, the following fire tests are to be conducted with the removable cover positioned to cause the worst case. The product shall be marked in accordance with 27.2(d). The tests on a pressure fryer are to be conducted with its cover open during the test. If a pressure fryer can be operated with its cover partially open or closed (but not latched), the fire tests are to also be conducted in these modes of operation.

19.3 The ignition shall be accomplished by defeating all temperature controls in the cooking appliance section in order to self-ignite the grease or cooking oil. For deep fat fryers, this will generally occur when the cooking oil reaches a temperature in excess of 600°F (315.6°C). In each case, the hood air passageways and filters are to be coated with lard prior to this testing. The lard shall be applied with a density of 0.3 pound per square foot (1.5 kg/m^2) or at the lesser density required to permit sufficient air flow to restrict the lower air flow control from functioning.

19.4 The extinguisher cylinder is to be pressurized to simulate the minimum storage temperature for the automatic operation fire test condition. The extinguishing system unit is to be allowed to operate automatically and the time between auto-ignition and unit actuation is to be determined.

19.5 The extinguisher cylinder is to be pressurized to simulate the minimum storage temperature for the extended operation fire test condition. The extinguishing system unit is to be manually actuated after a preburn time interval equal to the time recorded for unit actuation during the automatic operation test plus 30 seconds.

air from the exhaust outlet discharges away from such locations.

506.4 Ducts serving Type II hoods. Single or combined Type II exhaust systems for food-processing operations shall be independent of all other exhaust systems. Commercial kitchen exhaust systems serving Type II hoods shall comply with Sections 506.4.1 and 506.4.2.

506.4.1 Type II exhaust outlets. Exhaust outlets for ducts serving Type II hoods shall comply with Sections 401.4 and 401.4.2. Such outlets shall be protected against local weather conditions and shall meet the provisions for exterior wall opening protectives in accordance with the *International Building Code.*

506.4.2 Ducts. Ducts and plenums serving Type II hoods shall be constructed of rigid metallic materials. Duct construction, installation, bracing and supports shall comply with Chapter 6. Ducts subject to positive pressure and ducts conveying moisture-laden or waste-heat-laden air shall be constructed, joined and sealed in an approved manner.

506.5 Exhaust equipment. Exhaust equipment, including fans and grease reservoirs, shall comply with Sections 506.5.1 through 506.5.5 and shall be of an approved design or shall be listed for the application.

506.5.1 Exhaust fans. Exhaust fan housings serving a Type I hood shall be constructed as required for grease ducts in accordance with Section 506.3.1.1.

Exception: Fans listed and labeled in accordance with UL 762.

506.5.1.1 Fan motor. Exhaust fan motors shall be located outside of the exhaust airstream.

506.5.2 Exhaust fan discharge. Exhaust fans shall be positioned so that the discharge will not impinge on the roof, other equipment or appliances or parts of the structure. A vertical discharge fan shall be manufactured with an approved drain outlet at the lowest point of the housing to permit drainage of grease to an approved grease reservoir.

506.5.3 Exhaust fan mounting. An upblast fan shall be hinged and supplied with a flexible weatherproof electrical cable to permit inspection and cleaning. The ductwork shall extend a minimum of 18 inches (457 mm) above the roof surface.

506.5.4 Clearances. Exhaust equipment serving a Type I hood shall have a clearance to combustible construction of not less than 18 inches (457 mm).

Exception: Factory-built exhaust equipment installed in accordance with Section 304.1 and listed for a lesser clearance.

506.5.5 Termination location. The outlet of exhaust equipment serving Type I hoods shall be in accordance with Section 506.3.12.

Exception: The minimum horizontal distance between vertical discharge fans and parapet-type building structures shall be 2 feet (610 mm) provided that such structures are not higher than the top of the fan discharge opening.

SECTION 507
COMMERCIAL KITCHEN HOODS

507.1 General. Commercial kitchen exhaust hoods shall comply with the requirements of this section and NFPA 96-2004, as listed in chapter 15. Hoods shall be type I or type II and shall be designed to capture and confine cooking vapors and residues.

Exceptions:

1. Factory-built commercial exhaust hoods which are tested in accordance with UL 710B-2004 or 197SB-2003, as listed in chapter 15, listed, labeled, and installed in accordance with section 304.1 shall not be required to comply with sections 507.4, 507.7, 507.11, 507.12, 507.13, 507.14, and 507.15 of the code.
2. Factory-built commercial cooking recirculating systems which are tested in accordance with UL 197-2003, as listed in chapter 15, listed, labeled, and installed in accordance with section 304.1 of the code shall not be required to comply with sections 507.4, 507.5, 507.7, 507.12, 507.13, 507.14, and 507.15 of the code.
3. Net exhaust volumes for hoods may be reduced during no-load cooking conditions, where engineered or listed multi-speed or variable-speed controls automatically operate the exhaust system to maintain capture and removal of cooking effluents as required.

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507.2 Where required. A Type I or Type II hood shall be installed at or above all commercial cooking appliances in accordance with Sections 507.2.1 and 507.2.2. Where any cooking appliance under a single hood requires a Type I hood, a Type I hood shall be installed. Where a Type II hood is required, a Type I or Type II hood shall be installed.

507.2.1 Type I hoods. Type I hoods shall be installed where cooking appliances produce grease or smoke, such as occurs with griddles, fryers, broilers, ovens, ranges and wok ranges.

507.2.1.1 Operation. Type I hood systems shall be designed and installed to automatically activate the exhaust fan whenever cooking operations occur. The activation of the exhaust fan shall occur through an interlock with the cooking appliances, by means of heat sensors or by means of other approved methods.

507.2.2 Type II hoods. Type II hoods shall be installed where cooking or dishwashing appliances produce heat or steam and do not produce grease or smoke, such as steamers, kettles, pasta cookers, dishwashing machines, and ovens.

Exceptions:

1. Under-counter type commercial dishwashing machines.
2. A type II hood is not required for dishwashers and potwashers that are provided with heat and water vapor exhaust systems that are supplied by the

appliance manufacturer and are installed in accordance with the manufacturer's instructions.

3. Ovens used for re-heating foods previously cooked.

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507.2.3 Domestic cooking appliances used for commercial purposes. Domestic cooking appliances utilized for commercial purposes shall be provided with Type I or Type II hoods as required for the type of appliances and processes in accordance with Sections 507.2, 507.2.1 and 507.2.2.

507.2.4 Extra-heavy-duty. Type I hoods for use over extra-heavy-duty cooking appliances shall not cover other appliances that require fire extinguishing equipment and such hoods shall discharge to an exhaust system that is independent of other exhaust systems.

507.3 Fuel-burning appliances. Where vented fuel-burning appliances are located in the same room or space as the hood, provisions shall be made to prevent the hood system from interfering with normal operation of the appliance vents.

507.4 Type I materials. Type I hoods shall be constructed of steel not less than 0.043 inch (1.09 mm) (No. 18 MSG) in thickness, or stainless steel not less than 0.037 inch (0.94 mm) (No. 20 MSG) in thickness.

507.5 Type II hood materials. Type II hoods shall be constructed of steel not less than 0.030 inch (0.76 mm) (No. 22 Gage) in thickness, stainless steel not less than 0.024 inch (0.61 mm) (No. 24 Gage) in thickness, copper sheets weighing not less than 24 ounces per square foot (7.3 kg/m^2), or of other approved material and gage.

507.6 Supports. Type I hoods shall be secured in place by noncombustible supports. All Type I and Type II hood supports shall be adequate for the applied load of the hood, the unsupported ductwork, the effluent loading, and the possible weight of personnel working in or on the hood.

507.7 Hood joints, seams and penetrations. Hood joints, seams and penetrations shall comply with Sections 507.7.1 and 507.7.2.

507.7.1 Type I hoods. External hood joints, seams and penetrations for Type I hoods shall be made with a continuous external liquid-tight weld or braze to the lowest outermost perimeter of the hood. Internal hood joints, seams, penetrations, filter support frames, and other appendages attached inside the hood shall not be required to be welded or brazed but shall be otherwise sealed to be grease tight.

Exceptions:

1. Penetrations shall not be required to be welded or brazed where sealed by devices that are listed for the application.
2. Internal welding or brazing of seams, joints, and penetrations of the hood shall not be prohibited provided that the joint is formed smooth or ground so as to not trap grease, and is readily cleanable.

507.7.2 Type II hoods. Joints, seams and penetrations for Type II hoods shall be constructed as set forth in Chapter 6, shall be sealed on the interior of the hood and shall provide a smooth surface that is readily cleanable and water tight.

507.8 Cleaning and grease gutters. A hood shall be designed to provide for thorough cleaning of the entire hood. Grease gutters shall drain to an approved collection receptacle that is fabricated, designed and installed to allow access for cleaning.

507.9 Clearances for type I hood. A type I hood shall be installed with clearances from combustibles as required by NFPA 96-2004 as listed in chapter 15.

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507.10 Hoods penetrating a ceiling. Type I hoods or portions thereof penetrating a ceiling, wall or furred space shall comply with all the requirements of Section 506.3.10.

507.11 Grease filters. Type I hoods shall be equipped with listed grease filters designed for the specific purpose. Grease-collecting equipment shall be provided with access for cleaning. The lowest edge of a grease filter located above the cooking surface shall be not less than the height specified in Table 507.11.

TABLE 507.11
MINIMUM DISTANCE BETWEEN THE LOWEST EDGE OF A GREASE FILTER AND THE COOKING SURFACE OR THE HEATING SURFACE

TYPE OF COOKING APPLIANCES	HEIGHT ABOVE COOKING SURFACE (feet)
Without exposed flame	0.5
Exposed flame and burners	2
Exposed charcoal and charbroil type	3.5

For SI: 1 foot = 304.8 mm.

507.11.1 Criteria. Filters shall be of such size, type and arrangement as will permit the required quantity of air to pass through such units at rates not exceeding those for which the filter or unit was designed or approved. Filter units shall be installed in frames or holders so as to be readily removable without the use of separate tools, unless designed and installed to be cleaned in place and the system is equipped for such cleaning in place. Removable filter units shall be of a size that will allow them to be cleaned in a dishwashing machine or pot sink. Filter units shall be arranged in place or provided with drip-intercepting devices to prevent grease or other condensate from dripping into food or on food preparation surfaces.

507.11.2 Mounting position. Filters shall be installed at an angle of not less than 45 degrees (0.79 rad) from the horizontal and shall be equipped with a drip tray beneath the lower edge of the filters.

507.12 Canopy size and location. The inside lower edge of canopy-type Type I and II commercial hoods shall overhang or extend a horizontal distance of not less than 6 inches (152 mm) beyond the edge of the top horizontal surface of the appliance on all open sides. The vertical distance between the front lower lip of the hood and such surface shall not exceed 4 feet (1219 mm).

Exception: The hood shall be permitted to be flush with the outer edge of the cooking surface where the hood is closed to the appliance side by a noncombustible wall or panel.

clear space measured perpendicular to the opening shall be one and one-half times the depth of the opening. The depth of the opening shall be measured from the average adjoining ground level to the bottom of the opening.

SECTION 403
MECHANICAL VENTILATION

403.1 Ventilation system. Mechanical ventilation shall be provided by a method of supply air and return or exhaust air. The amount of supply air shall be approximately equal to the amount of return and exhaust air. The system shall not be prohibited from producing negative or positive pressure. The system to convey ventilation air shall be designed and installed in accordance with Chapter 6.

Ventilation supply systems shall be designed to deliver the required rate of supply air to the occupied zone within an occupied space. The occupied zone shall have boundaries measured at 3 inches (76 mm) and 72 inches (1829 mm) above the floor and 24 inches (610 mm) from the enclosing walls.

403.2 Outdoor air required. The minimum ventilation rate of outdoor air shall be determined in accordance with Section 403.3.

Exception: Where the registered design professional demonstrates that an engineered ventilation system design will prevent the maximum concentration of contaminants from exceeding that obtainable by the rate of outdoor air ventilation determined in accordance with Section 403.3, the minimum required rate of outdoor air shall be reduced in accordance with such engineered system design.

403.2.1 Recirculation of air. The air required by Section 403.3 shall not be recirculated. Air in excess of that required by Section 403.3 shall not be prohibited from being recirculated as a component of supply air to building spaces, except that:

1. Ventilation air shall not be recirculated from one dwelling to another or to dissimilar occupancies.
2. Supply air to a swimming pool and associated deck areas shall not be recirculated unless such air is dehumidified to maintain the relative humidity of the area at 60 percent or less. Air from this area shall not be recirculated to other spaces where 10 percent or more of the resulting supply airstream consists of air recirculated from these spaces.
3. Where mechanical exhaust is required by Note b in Table 403.3, recirculation of air from such spaces shall be prohibited. All air supplied to such spaces shall be exhausted, including any air in excess of that required by Table 403.3.
4. Where mechanical exhaust is required by Note h in Table 403.3, mechanical exhaust is required and recirculation is prohibited where 10 percent or more of the resulting supply airstream consists of air recirculated from these spaces.

403.2.2 Transfer air. Except where recirculation from such spaces is prohibited by Table 403.3, air transferred from occupied spaces is not prohibited from serving as makeup air for required exhaust systems in such spaces as kitchens, baths, toilet rooms, elevators and smoking lounges. The amount of transfer air and exhaust air shall be sufficient to provide the flow rates as specified in Sections 403.3 and 403.3.1. The required outdoor air rates specified in Table 403.3 shall be introduced directly into such spaces or into the occupied spaces from which air is transferred or a combination of both.

403.3 Ventilation rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with Table 403.3 based on the occupancy of the space and the occupant load or other parameter as stated therein. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3. Ventilation rates for occupancies not represented in Table 403.3 shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

Exception: The occupant load is not required to be determined, based on the estimated maximum occupant load rate indicated in Table 403.3 where approved statistical data document the accuracy of an alternate anticipated occupant density.

403.3.1 System operation. The minimum flow rate of outdoor air that the ventilation system must be capable of supplying during its operation shall be permitted to be based on the rate per person indicated in Table 403.3 and the actual number of occupants present.

403.3.2 Common ventilation system. Where spaces having different ventilation rate requirements are served by a common ventilation system, the ratio of outdoor air to total supply air for the system shall be determined based on the space having the largest outdoor air requirement or shall be determined in accordance with the following formula:

$$Y = \frac{X}{(1 + X - Z)} \qquad \text{(Equation 4-1)}$$

where

$Y = V_{ot}/V_{st}$ = Corrected fraction of outdoor air in system supply.

$X = V_{on}/V_{st}$ = Uncorrected fraction of outdoor air in system supply.

$Z = V_{oc}/V_{sc}$ = Fraction of outdoor air in critical space. The critical space is that space with the greatest required fraction of outdoor air in the supply to this space.

V_{ot} = Corrected total outdoor airflow rate.

V_{st} = Total supply flow rate, i.e., the sum of all supply for all branches of the system.

V_{on} = Sum of outdoor airflow rates for all branches on system.

V_{oc} = Outdoor airflow rate required in critical spaces.

V_{sc} = Supply flow rate in critical space.

403.3.3 Variable air volume system control. Variable air volume air distribution systems, other than those designed to supply only 100-percent outdoor air, shall be provided with controls to regulate the flow of outdoor air. Such control system shall be designed to maintain the flow of outdoor air at a rate of not less than that required by Section 403 over the entire range of supply air operating rates.

403.3.4 Balancing. Ventilation systems shall be balanced by an approved method. Such balancing shall verify that the ventilation system is capable of supplying the airflow rates required by Section 403.

SECTION 404
ENCLOSED PARKING GARAGES

404.1 Enclosed parking garages. Mechanical ventilation systems for enclosed parking garages are not required to operate continuously where the system is arranged to operate automatically upon detection of a concentration of carbon monoxide of 25 parts per million (ppm) by approved automatic detection devices. Upon activation such systems shall operate for 30 minutes.

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404.2 Minimum ventilation. Automatic operation of the system shall not reduce the ventilation rate below 0.05 cfm per square foot (0.00025 $m^3/s \cdot m^2$) of the floor area and the system shall be capable of producing a ventilation rate of 1.5 cfm per square foot (0.0076$m^3/s \cdot m^2$) of floor area.

404.3 Occupied spaces accessory to public garages. Connecting offices, waiting rooms, ticket booths and similar uses that are accessory to a public garage shall be maintained at a positive pressure and shall be provided with ventilation in accordance with Section 403.3.

SECTION 405
SYSTEMS CONTROL

405.1 General. Mechanical ventilation systems shall be provided with manual or automatic controls that will operate such systems whenever the spaces are occupied. Air-conditioning systems that supply required ventilation air shall be provided with controls designed to automatically maintain the required outdoor air supply rate during occupancy.

SECTION 406
VENTILATION OF UNINHABITED SPACES

406.1 General. Uninhabited spaces, such as crawl spaces and attics, shall be provided with natural ventilation openings as required by the *International Building Code* or shall be provided with a mechanical exhaust and supply air system. The mechanical exhaust rate shall be not less than 0.02 cfm per square foot (0.00001 $m^3/s \cdot m^2$) of horizontal area and shall be automatically controlled to operate when the relative humidity in the space served exceeds 60 percent.

TABLE 403.3
REQUIRED OUTDOOR VENTILATION AIR

OCCUPANCY CLASSIFICATION	ESTIMATED MAXIMUM OCCUPANT LOAD, PERSONS PER 1,000 SQUARE FEET[a]	OUTDOOR AIR [Cubic feet per minute (cfm) per person] UNLESS NOTED[e]
Correctional facilities		
Cells		
without plumbing fixtures	20	20
with plumbing fixtures[g, h]	20	20
Dining halls	100	15
Guard stations	40	15
Dry cleaners, laundries		
Coin-operated dry cleaner	20	15
Coin-operated laundries	20	15
Commercial dry cleaner	30	30
Commercial laundry	10	25
Storage, pick up	30	35
Education		
Auditoriums	150	15
Classrooms	50	15
Corridors	—	0.10 cfm/ft^2
Laboratories	30	20
Libraries	20	15
Locker rooms[h]	—	0.50 cfm/ft^2
Music rooms	50	15
Smoking lounges[b, g]	70	60
Training shops	30	20
Food and beverage service		
Bars, cocktail lounges	100	30
Cafeteria, fast food	100	20
Dining rooms	70	20
Kitchens (cooking)[f, g]	20	15
Hospitals, nursing and convalescent homes		
Autopsy rooms[b]	—	0.50 cf m/ft^2
Medical procedure rooms	20	15
Operating rooms	20	30
Patient rooms	10	25
Physical therapy	20	15
Recovery and ICU	20	15
Hotels, motels, resorts and dormitories		
Assembly rooms	120	15
Bathrooms[g, h]	—	35
Bedrooms	—	30 cfm per room
Conference rooms	50	20
Dormitory sleeping areas	20	15
Gambling casinos	120	30
Living rooms	—	30 cfm per room
Lobbies	30	15
Offices		
Conference rooms	50	20
Office spaces	7	20
Reception areas	60	15
Telecommunication centers and data entry	60	20

(continued)

3.3.35.2 *Limited-Combustible Material.* Refers to a building construction material not complying with the definition of noncombustible material that, in the form in which it is used, has a potential heat value not exceeding 3500 Btu/lb (8141 kJ/kg), where tested in accordance with NFPA 259 and includes (1) materials having a structural base of noncombustible material, with a surfacing not exceeding a thickness of ⅛ in. (3.2 mm) that has a flame spread index not greater than 50; and (2) materials, in the form and thickness used, other than as described in (1), having neither a flame spread index greater than 25 nor evidence of continued progressive combustion, and of such composition that surfaces that would be exposed by cutting through the material on any plane would have neither a flame spread index greater than 25 nor evidence of continued progressive combustion. [*5000*:3.3]

3.3.35.3* *Noncombustible Material.* A material not capable of supporting combustion.

3.3.36 Pitched. To be fixed or set at a desired angle or inclination.

3.3.37 Qualified. A competent and capable person or company that has met the requirements and training for a given field acceptable to the AHJ.

3.3.38 Recirculating Systems. Systems for control of smoke or grease-laden vapors from commercial cooking equipment that do not exhaust to the outside.

3.3.39 Removable. Capable of being transferred to another location with a limited application of effort and tools.

3.3.40 Replacement Air. Air deliberately brought into the structure, then specifically to the vicinity of either a combustion process or a mechanically or thermally forced exhausting device, to compensate for the vapor and/or gases being consumed or expelled.

3.3.41 Single Hazard Area. Where two or more hazards can be simultaneously involved in fire by reason of their proximity, as determined by the authority having jurisdiction.

3.3.42 Solid Cooking Fuel. Any solid, organic, consumable fuel such as briquettes, mesquite, hardwood, or charcoal.

3.3.43 Solvent. A substance (usually liquid) capable of dissolving or dispersing another substance; a chemical compound designed and used to convert solidified grease into a liquid or semiliquid state in order to facilitate a cleaning operation.

3.3.44 Space.

3.3.44.1 *Concealed Spaces.* That portion(s) of a building behind walls, over suspended ceilings, in pipe chases, attics, and in whose size might normally range from 44.45 mm (1¾ in.) stud spaces to 2.44 m (8 ft) interstitial truss spaces and that might contain combustible materials such as building structural members, thermal and/or electrical insulation, and ducting.

3.3.44.2 *Confined Space.* A space whose volume is less than 1.42 m^3/ 293 W (50 ft^3/1000 Btu/hr) of the aggregate input rating of all appliances installed in that space. [**211**:3.3]

3.3.45 Spark Arrester. A device or method that minimizes the passage of airborne sparks and embers into a plenum, duct, and flue.

3.3.46 Thermal Recovery Unit. A device or series of devices whose purpose is to reclaim only the heat content of air, vapors, gases, or fluids that are being expelled through the exhaust system and to transfer the thermal energy so reclaimed to a location whereby a useful purpose can be served.

3.3.47* Trained. A person who has become proficient in performing a skill reliably and safely through instruction and practice/field experience acceptable to the AHJ.

3.3.48 Trap. A cuplike or U-shaped configuration located on the inside of a duct system component where liquids can accumulate.

Chapter 4 General Requirements

4.1 General.

4.1.1 Cooking equipment used in processes producing smoke or grease-laden vapors shall be equipped with an exhaust system that complies with all the equipment and performance requirements of this standard.

4.1.1.1* Cooking equipment that has been listed in accordance with UL 197 or an equivalent standard for reduced emissions shall not be required to be provided with an exhaust system.

4.1.1.2 The listing evaluation of cooking equipment covered by 4.1.1.1 shall demonstrate that the grease discharge at the exhaust duct of a test hood placed over the appliance shall not exceed 5 mg/m^3 when operated with a total airflow of 0.236 cubic meters per second (500 cfm).

The text of 4.1.1 has been revised by a tentative interim amendment (TIA). See page 1.

4.1.2 All such equipment and its performance shall be maintained in accordance with the requirements of this standard during all periods of operation of the cooking equipment.

4.1.3 The following equipment shall be kept in good working condition:

(1) Cooking equipment
(2) Hoods
(3) Ducts (if applicable)
(4) Fans
(5) Fire-extinguishing systems
(6) Special effluent or energy control equipment

4.1.3.1 Maintenance and repairs shall be performed on all components at intervals necessary to maintain these conditions.

4.1.4 All airflows shall be maintained.

4.1.5 The responsibility for inspection, maintenance, and cleanliness of the ventilation control and fire protection of the commercial cooking operations shall be the ultimate responsibility of the owner of the system provided that this responsibility has not been transferred in written form to a management company or other party.

4.1.6* All solid fuel cooking equipment shall comply with the requirements of Chapter 14.

4.1.7 Multi-tenant applications shall require the concerted cooperation of design, installation, operation, and maintenance responsibilities by tenants and by the building owner.

4.1.8 All interior surfaces of the exhaust system shall be accessible for cleaning and inspection purposes.

4.1.9* Cooking equipment used in fixed, mobile, or temporary concessions, such as trucks, buses, trailers, pavilions, tents, or any form of roofed enclosure, shall comply with this standard.

4.2* Clearance.

4.2.1 Where enclosures are not required, hoods, grease removal devices, exhaust fans, and ducts shall have a clearance of at least 457 mm (18 in.) to combustible material, 76 mm (3 in.) to limited-combustible material, and 0 mm (0 in.) to noncombustible material.

4.2.2 Where a hood, duct, or grease removal device is listed for clearances less than those required in 4.2.1, the listing requirements shall be permitted.

4.2.3 Clearance Reduction.

4.2.3.1 Where a clearance reduction system consisting of 0.33 mm (0.013 in.) (28 gauge) sheet metal spaced out 25 mm (1 in.) on noncombustible spacers is provided, there shall be a minimum of 229 mm (9 in.) clearance to combustible material.

4.2.3.2 Where a clearance reduction system consisting of 0.69 mm (0.027 in.) (22 gauge) sheet metal on 25 mm (1 in.) mineral wool batts or ceramic fiber blanket reinforced with wire mesh or equivalent spaced out 25 mm (1 in.) on noncombustible spacers is provided, there shall be a minimum of 76 mm (3 in.) clearance to combustible material.

4.2.3.3 Zero clearance to limited-combustible materials shall be permitted where protected by metal lath and plaster, ceramic tile, quarry tile, other noncombustible materials or assembly of noncombustible materials, or materials and products that are listed for the purpose of reducing clearance.

4.2.4 Clearance Integrity.

4.2.4.1 In the event of damage, the material or product shall be repaired and restored to meet its intended listing or clearance requirements and shall be acceptable to the authority having jurisdiction.

4.2.4.2* In the event of a fire within a kitchen exhaust system, the duct and its enclosure (rated shaft, factory-built grease duct enclosure, or field-applied grease duct enclosure) shall be inspected by qualified personnel to determine whether the duct and protection method are structurally sound, capable of maintaining their fire protection function, and in compliance with this standard for continued operation.

4.2.4.3 Protection shall be provided on the wall from the bottom of the hood to the floor, or to the top of the noncombustible material extending to the floor, to the same level as required in 4.2.1.

4.2.4.4 The protection methods for ducts to reduce clearance shall be applied to the combustible or limited-combustible construction, not to the duct itself.

4.3 Field-Applied and Factory-Built Grease Duct Enclosures.

4.3.1 Field-applied grease duct enclosures and factory-built grease duct enclosures shall be listed in accordance with UL 2221, *Standard for Tests of Fire Resistive Grease Duct Enclosure Assemblies*, or equivalent standard and installed in accordance with the manufacturer's instructions and the listing requirements.

4.3.2 Field-applied grease duct enclosures and factory-built grease duct enclosures shall demonstrate that they provide mechanical and structural integrity, resiliency, and stability when subjected to expected building environmental conditions, duct movement under general operating conditions, and duct movement due to fire conditions.

4.3.3 The specifications of material, gauge, and construction of the duct used in the testing and listing of field-applied grease duct enclosures and factory-built grease duct enclosures shall be included as minimum requirements in their listing and installation documentation.

4.3.4 Clearance Options for Field-Applied and Factory-Built Grease Duct Enclosures. The following clearance options for which field-applied grease duct enclosures and factory-built grease duct enclosures have been successfully evaluated shall be clearly identified in their listing and installation documentation and on their label:

(1) Open combustible clearance at manufacturer's requested dimensions
(2) Closed combustible clearance at manufacturer's requested dimensions, with or without specified ventilation
(3) Rated shaft clearance at manufacturer's requested dimensions, with or without specified ventilation

4.4 Building and Structural Duct Contact.

4.4.1 A duct shall be permitted to contact noncombustible floors, interior walls, and other noncombustible structures or supports, but it shall not be in contact for more than 50 percent of its surface area per each lineal foot of contact length.

4.4.2 Where duct contact must exceed the requirements of 4.4.1, the duct shall be protected from corrosion.

4.4.3 Where the duct is protected with a material or product listed for the purpose of reducing clearance to zero, the duct shall be permitted to exceed the contact limits of 4.4.1 without additional corrosion protection.

4.5 Duct Clearances to Enclosures. Clearances between the duct and interior surfaces of enclosures shall meet the requirements of Section 4.2.

4.6 Drawings. A drawing(s) of the exhaust system installation along with a copy of operating instructions for subassemblies and components used in the exhaust system, including electrical schematics, shall be kept on the premises.

4.7 Authority Having Jurisdiction Notification. If required by the authority having jurisdiction, notification in writing shall be given of any alteration, replacement, or relocation of any exhaust or extinguishing system or part thereof or cooking equipment.

Chapter 5 Hoods

5.1 Construction.

5.1.1 The hood or that portion of a primary collection means designed for collecting cooking vapors and residues shall be constructed of and be supported by steel not less than 1.09 mm (0.043 in.) (No. 18 MSG) in thickness, stainless steel not less than 0.94 mm (0.037 in.) (No. 20 MSG) in thickness, or other approved material of equivalent strength and fire and corrosion resistance.

Chapter 4 General Requirements

4.1 General.

4.1.1 Cooking equipment used in processes producing smoke or grease-laden vapors shall be equipped with an exhaust system that complies with all the equipment and performance requirements of this standard.

4.1.1.1* Cooking equipment that has been listed in accordance with UL 197 or an equivalent standard for reduced emissions shall not be required to be provided with an exhaust system.

4.1.1.2 The listing evaluation of cooking equipment covered by 4.1.1.1 shall demonstrate that the grease discharge at the exhaust duct of a test hood placed over the appliance shall not exceed 5 mg/m^3 when operated with a total airflow of 0.236 m^3/s (500 cfm).

4.1.2 All such equipment and its performance shall be maintained in accordance with the requirements of this standard during all periods of operation of the cooking equipment.

4.1.3 The following equipment shall be kept in working condition:

(1) Cooking equipment
(2) Hoods
(3) Ducts (if applicable)
(4) Fans
(5) Fire-extinguishing systems
(6) Special effluent or energy control equipment

4.1.3.1 Maintenance and repairs shall be performed on all components at intervals necessary to maintain good working condition.

4.1.4 All airflows shall be maintained.

4.1.5 The responsibility for inspection, maintenance, and cleanliness of the ventilation control and fire protection of the commercial cooking operations shall be the ultimate responsibility of the owner of the system provided that this responsibility has not been transferred in written form to a management company or other party.

4.1.6* All solid fuel cooking equipment shall comply with the requirements of Chapter 14.

4.1.7 Multi-tenant applications shall require the concerted cooperation of design, installation, operation, and maintenance responsibilities by tenants and by the building owner.

4.1.8 All interior surfaces of the exhaust system shall be accessible for cleaning and inspection purposes.

4.1.9* Cooking equipment used in fixed, mobile, or temporary concessions, such as trucks, buses, trailers, pavilions, tents, or any form of roofed enclosure, shall comply with this standard.

4.2* Clearance.

4.2.1 Where enclosures are not required, hoods, grease removal devices, exhaust fans, and ducts shall have a clearance of at least 457 mm (18 in.) to combustible material, 76 mm (3 in.) to limited-combustible material, and 0 mm (0 in.) to noncombustible material.

4.2.2 Where a hood, duct, or grease removal device is listed for clearances less than those required in 4.2.1, the listing requirements shall be permitted.

4.2.3 Clearance Reduction.

4.2.3.1 Where a clearance reduction system consisting of 0.33 mm (0.013 in.) (28 gauge) sheet metal spaced out 25 mm (1 in.) on noncombustible spacers is provided, there shall be a minimum of 229 mm (9 in.) clearance to combustible material.

4.2.3.2 Where a clearance reduction system consisting of 0.69 mm (0.027 in.) (22 gauge) sheet metal on 25 mm (1 in.) mineral wool batts or ceramic fiber blanket reinforced with wire mesh or equivalent spaced out 25 mm (1 in.) on noncombustible spacers is provided, there shall be a minimum of 76 mm (3 in.) clearance to combustible material.

4.2.3.3 Zero clearance to limited-combustible materials shall be permitted where protected by metal lath and plaster, ceramic tile, quarry tile, other noncombustible materials or assembly of noncombustible materials, or materials and products that are listed for the purpose of reducing clearance.

4.2.4 Clearance Integrity.

4.2.4.1 In the event of damage, the material or product shall be repaired and restored to meet its intended listing or clearance requirements and shall be acceptable to the authority having jurisdiction.

4.2.4.2* In the event of a fire within a kitchen exhaust system, the duct and its enclosure (rated shaft, factory-built grease duct enclosure, or field-applied grease duct enclosure) shall be inspected by qualified personnel to determine whether the duct and protection method are structurally sound, capable of maintaining their fire protection function, and in compliance with this standard for continued operation.

4.2.4.3 Protection shall be provided on the wall from the bottom of the hood to the floor, or to the top of the noncombustible material extending to the floor, to the same level as required in 4.2.1.

4.2.4.4 The protection methods for ducts to reduce clearance shall be applied to the combustible or limited-combustible construction, not to the duct itself.

4.3 Field-Applied and Factory-Built Grease Duct Enclosures.

4.3.1 Field-applied grease duct enclosures shall be protected with a through-penetration firestop system classified in accordance with ASTM E 814 or UL 1479 having an "F" and "T" rating equal to the fire resistance rating of the assembly being penetrated.

4.3.1.1 The surface of the field fabricated grease duct shall be continuously covered on all sides from the point at which the duct enclosure penetrates a ceiling, wall, or floor to the outlet terminal.

4.3.1.2 The field-applied grease duct shall be listed in accordance with ASTM E 2336, and installed in accordance with the manufacturer's instructions and the listing requirements.

4.3.2* Where subject to physical damage, field-applied grease duct enclosures shall be protected as deemed necessary by the authority having jurisdiction.

4.3.3 Factory-built grease duct enclosures shall be protected with a through-penetration firestop system classified in accordance with ASTM E 814 or UL 1479 having an "F" and "T" rating equal to the fire resistance rating of the assembly being penetrated from the point at which the duct penetrates a ceiling, wall, or floor to the outlet terminal.

4.3.3.1 The factory-built grease duct protection system shall be listed in accordance with UL 2221.

4.3.3.2 The factory-built grease duct protection system shall be installed in accordance with the manufacturer's instructions and the listing requirements.

4.3.4 Field-applied grease duct enclosures and factory-built grease duct enclosures shall demonstrate that they provide mechanical and structural integrity, resiliency, and stability when subjected to expected building environmental conditions, duct movement under general operating conditions, and duct movement due to fire conditions.

4.3.5 The specifications of material, gauge, and construction of the duct used in the testing and listing of field-applied grease duct enclosures and factory-built grease duct enclosures shall be included as minimum requirements in their listing and installation documentation.

4.3.6 Clearance Options for Field-Applied and Factory-Built Grease Duct Enclosures. The following clearance options for which field-applied grease duct enclosures and factory-built grease duct enclosures have been successfully evaluated shall be clearly identified in their listing and installation documentation and on their labels:

(1) Open combustible construction clearance at manufacturer's requested dimensions
(2) Closed combustible construction clearance at manufacturer's requested dimensions, with or without specified ventilation
(3) Rated shaft clearance at manufacturer's requested dimensions, with or without specified ventilation

4.4 Building and Structural Duct Contact.

4.4.1 A duct shall be permitted to contact noncombustible floors, interior walls, and other noncombustible structures or supports, but it shall not be in contact for more than 50 percent of its surface area for each linear foot of contact length.

4.4.2 Where duct contact must exceed the requirements of 4.4.1, the duct shall be protected from corrosion.

4.4.3 Where the duct is listed for zero clearance to combustibles or is otherwise protected with a material or product listed for the purpose of reducing clearance to zero, the duct shall be permitted to exceed the contact limits of 4.4.1 without additional corrosion protection.

4.4.4 Where the duct is listed for zero clearance to combustibles, the duct shall be permitted to exceed the contact limits of 4.4.1 without additional corrosion protection.

4.5 Duct Clearances to Enclosures. Clearances between the duct and interior surfaces of enclosures shall meet the requirements of Section 4.2.

4.6 Drawings. A drawing(s) of the exhaust system installation along with copies of operating instructions for subassemblies and components used in the exhaust system, including electrical schematics, shall be kept on the premises.

4.7 Authority Having Jurisdiction Notification. If required by the authority having jurisdiction, notification in writing shall be given of any alteration, replacement, or relocation of any exhaust or extinguishing system or part thereof or cooking equipment.

Chapter 5 Hoods

5.1 Construction.

5.1.1 The hood or that portion of a primary collection means designed for collecting cooking vapors and residues shall be constructed of and be supported by steel not less than 1.09 mm (0.043 in.) (No. 18 MSG) in thickness, stainless steel not less than 0.94 mm (0.037 in.) (No. 20 MSG) in thickness, or other approved material of equivalent strength and fire and corrosion resistance.

5.1.2 All seams, joints, and penetrations of the hood enclosure that direct and capture grease-laden vapors and exhaust gases shall have a liquidtight continuous external weld to the hood's lower outermost perimeter.

5.1.3 Seams, joints, and penetrations of the hood shall be permitted to be internally welded, provided that the weld is formed smooth or ground smooth, so as to not trap grease, and is cleanable.

5.1.4* Internal hood joints, seams, filter support frames, and appurtenances attached inside the hood shall be sealed or otherwise made greasetight.

5.1.5 Penetrations shall be permitted to be sealed by devices that are listed for such use and whose presence does not detract from the hood's or duct's structural integrity.

5.1.6 Listed exhaust hoods with or without exhaust dampers shall be permitted to be constructed of materials required by the listing.

5.1.7 Listed exhaust hoods with or without exhaust dampers shall be permitted to be assembled in accordance with the listing requirements.

5.1.8 Eyebrow-Type Hoods.

5.1.8.1 Eyebrow-type hoods over gas or electric ovens shall be permitted to have a duct constructed as required in Chapter 7 from the oven flue(s) connected to the hood canopy upstream of the exhaust plenum, as shown in Figure 5.1.8.1.

5.1.8.2 The duct connecting the oven flue(s) to the hood canopy shall be connected with a continuous weld or have a duct-to-duct connection. *[See Figure 8.1.2.2(b) through Figure 8.1.2.2(d).]*

5.1.9 Insulation materials other than electrical insulation shall have a flame spread rating of 25 or less when tested in accordance with UL 723.

5.1.10 Adhesives or cements used in the installation of insulating materials shall comply with the requirements of 5.1.9 when tested with the specific insulating material.

5.1.11 Penetrations shall be sealed with listed devices in accordance with the requirements of 5.1.12.

5.1.12 Devices that require penetration of the hood, such as pipe and conduit penetration fittings and fasteners, shall be listed in accordance with UL 1978.

5.1.13 Wall-mounted exhaust hood assemblies shall be tight fitting against the back wall so as to not permit passage of grease vapor behind the hood or between the back wall and the hood assembly.

5.2 Hood Size. Hoods shall be sized and configured to provide for the capture and removal of grease-laden vapors. *(See 8.2.2.)*

506.7.1.5 There shall be at least one (1) inch (2.5 cm) between the duct and the wall protector. In no case shall the clearance between the duct and the wall surface be reduced below that shown in Table 5-2.

506.7.2 Duct systems operating at elevated temperatures above 140°F (60°C) shall have clearances from combustible building construction or any combustible material of not less than eighteen (18) inch (46 cm).

506.7.3 Where clearance is reduced by using an airspace between the combustible wall and the wall protector, air circulation shall be provided by one of the following methods.

506.7.3.1 Air circulation shall be permitted to be provided by leaving all edges of the wall protector open with at least a one (1) inch (2.5 cm) air gap.

506.7.3.2 If the wall protector is mounted on a single flat wall away from corners, air circulation shall be permitted to be provided by one of the following:

(A) Leaving top and bottom edges open to circulation by maintaining the one (1) inch (2.5 cm) air gap.

(B) Leaving top and both side edges open to circulation by maintaining the (1) inch (2.5 cm) air gap.

506.7.3.3 Wall protectors that cover two walls in a corner shall be permitted to be open at the top and bottom edges with at least a one (1) inch (2.5 cm) air gap. [NFPA 91:2.6.1 through 2.6.3.8]

506.8 Protection from Physical Damage. Ducts installed in locations where they are subject to physical damage shall be protected by suitable guards.

506.9 Exhaust Outlets. Outlets for exhausts that exceed 600°F (315°C) shall be in accordance with Table 5-7.

The termination point for exhaust ducts discharging to the atmosphere shall be not less than the following:

506.9.1 Ducts conveying explosive or flammable vapors, fumes, or dusts: thirty (30) feet (9,144 mm) from property line; ten (10) feet (3,048 mm) from openings into the building, six (6) feet (1,829 mm) from exterior walls or roofs; thirty (30) feet (9,144 mm) from combustible walls or openings into the building that are in the direction of the exhaust discharge; ten (10) feet (3,048 mm) above adjoining grade.

506.9.2 Other product-conveying outlets: ten (10) feet (3,048 mm) from property line; three (3) feet (914 mm) from exterior wall or roof; ten (10) feet (3,048 mm) from openings into the building; ten (10) feet (3,048 mm) above adjoining grade.

Part II – Commercial Hoods and Kitchen Ventilation

507.0 General Requirements.

507.1 Cooking equipment used in processes producing smoke or grease-laden vapors shall be equipped with an exhaust system that complies with all the equipment and performance requirements of this standard, and all such equipment and performance shall be maintained per this standard during all periods of operation of the cooking equipment. Specifically, the following equipment shall be kept in good working condition:

(A) Cooking equipment

(B) Hoods

(C) Ducts (if applicable)

(D) Fans

(E) Fire suppression systems

(F) Special effluent or energy control equipment

All airflows shall be maintained. Maintenance and repairs shall be performed on all components at intervals necessary to maintain these conditions.

507.1.1 All solid-fuel cooking equipment shall comply with the requirements of Section 517.0.

507.1.2 Multiple-tenancy applications shall require the concerted cooperation of design, installation, operation, and maintenance responsibilities by tenants and by the building owner.

507.1.3 All interior surfaces of the exhaust system shall be reasonably accessible for cleaning and inspection purposes.

507.1.4 Cooking equipment used in fixed, mobile, or temporary concessions, such as trucks, buses, trailers, pavilions, tents, or any form of roofed enclosure, shall comply with this standard unless all or part of the installation is exempted by the Authority Having Jurisdiction.

507.1.5 Cooking equipment that has been listed in accordance with UL 197 or an equivalent standard for reduced emissions shall not be required to be provided with an exhaust system. [NFPA 96: 4.1.1.1]

507.1.6 The listing evaluation of cooking equipment covered by section 507.1.5 shall demonstrate that the grease discharge at the exhaust duct of a test hood placed over the appliance shall not exceed 5 mg/m3 when operated with a total airflow of 0.236 cubic meters per second (500 dm). [NFPA 96 4.1.1.2]

507.1.7 The responsibility for inspection, maintenance, and cleanliness of the ventilation control and fire protection of the commercial cooking operations shall be the ultimate responsibility of the owner of the system provided that this responsibility has not been transferred in written form to a management company or other party. [NFPA 96 4.1.5]

507.2 Clearance.

507.2.1 Except where enclosures are required, hoods, grease removal devices, exhaust fans, and ducts shall have a clearance of at least eighteen (18) inches (457.2 mm) to combustible material, three (3) inches (76.2 mm) to limited-combustible material, and 0 inches (0 mm) to noncombustible material.

Exception No. 1: Where the hood, duct, or grease removal device is listed for lesser clearances.

Exception No. 2: Reduced clearance to combustible material if the combustible material is protected as follows:

(a) 0.013 inch (0.33 mm) (no. 28 gauge) sheet metal spaced out one (1) inch (25.4 mm) on noncombustible spacers shall have nine (9) inch (228.6 mm) clearance to combustible material.

(b) 0.027 inch (0.69 mm) (No. 22 gauge) sheet metal on one (1) inch (25.4 mm) mineral wool batts or ceramic fiber blanket reinforced with wire mesh or equivalent spaced out one (1) inch (25.4 mm) on noncombustible spacers shall have three (3) inch (76.2 mm) clearance to combustible material.

Exception No. 3: Reduced clearance to limited-combustible materials to zero clearance where protected by metal lath and plaster, ceramic tile, quarry tile, other noncombustible materials or assembly of noncombustible materials, or materials and products that are listed for the purpose of reducing clearance and are acceptable to the Authority Having Jurisdiction. The listed materials shall be installed in accordance with the conditions of the listing and the manufacturer's instructions and shall be acceptable to the Authority Having Jurisdiction.

507.2.1.1 Measures shall be taken to prevent physical damage to any material or product used for the purpose of reducing clearances. In the event of damage, the material or product shall be repaired and restored to meet its intended listing or clearance requirements and shall be acceptable to the Authority Having Jurisdiction. In the event of a fire within a kitchen exhaust system, the duct and its enclosure (rated shaft, factory-built grease duct enclosure, or field-applied grease duct enclosure) shall be inspected by qualified personnel to determine whether the duct and protection method are structurally sound, capable of maintaining their fire-protection function, and suitable for continued operation.

507.2.2 The protection methods for ducts to reduce clearance shall be applied to the combustible or limited-combustible construction, not to the duct itself.

Exception: Field-applied grease duct enclosures and factory-built grease duct enclosures.

507.2.3 Field-Applied and Factory Built Grease Duct Enclosures. Field-applied grease duct enclosures and factory-built grease duct enclosures shall listed in accordance with UL 2221, Standard for Tests of Fire Resistive Grease Duct Enclosure Assemblies, or equivalent standard and installed in accordance with the manufacturer's instructions and the listing requirements. [NFPA 96: 4.3.1]

507.2.4 Field-applied grease duct enclosures and factory-built grease duct enclosures shall demonstrate that they provide sufficient mechanical and structural integrity, resiliency, and stability when subjected to expected building environmental conditions, duct movement under general operating conditions, and duct movement due to fire conditions. [NFPA 96: 4.3.2]

507.2.4.1 Measures shall be taken to prevent physical damage to any material or product used for the purpose of reducing clearances.

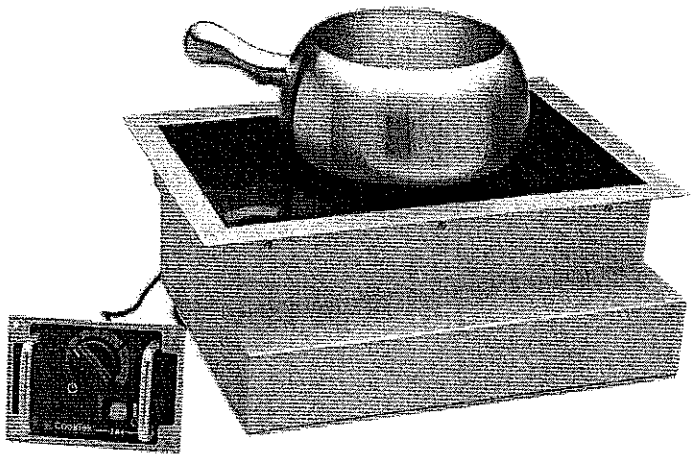
Exception: When the duct is protected with a field-applied grease duct enclosure or factory-built grease duct enclosure.

507.2.4.2 The specifications of material, gauge, and construction of the duct used in the testing and listing of field-applied grease duct enclosures and factory-built grease duct enclosures shall be included as minimum requirements in their listing and installation documentation. [NFPA 96: 4.3.3]

CookTek®
MagnaWave® Systems

DROP-IN MELTING POT
MPD 1000

PRODUCT:	QTY:	ITEM #:



US C Entela Certified NSF CE

Standard Features:

- Drop-In countertop design with stainless steel edging, aluminum housing and control box, heavy duty electronic components, and high impact ceramic glass top designed for use in the commercial kitchen
- Adjustable rheostat control knob for ease of use and automatic power or temperature control
- SmartTemp™ Temperature allows for 22 precise temperature settings and 20 power cook settings
- Pan Maximizer feature achieves maximum heating of any induction compatible pan
- Microprocessor monitors vital components 120 times per second to check for overheating, power supply problems, and more. Cooktop shuts off and displays error codes enabling user to diagnose and fix minor problems
- LED display for precise user feedback
- Automatic pan detection allows for instant energy transmission to pan
- Automatic shut-off feature prohibits overheating
- Drop-In cooktops and control boxes manufactured and designed for easy installation
- Integral cooling fan keeps internal electronics cool
- One year limited warranty
- Made-in-the-USA
- NSF and Entela Listed

Specifications:

Shall be a CookTek drop-in induction cooktop, Model_____with a total kW rating of 1. Unit shall be manufactured in the United States and constructed of an aluminum housing and control box, with a high impact ceramic glass top. Unit shall be equipped with a built-in SmartTempTM microprocessor that performs precise temperature control, auto shut-off to prevent over-heating, self-diagnostics, and a pan maximizer feature that ensures maximum heating of any induction compatible pan. Unit shall have adjustable rheostat control with 20 power cook settings and 22 precise temperature settings. Unit shall have LED display located underneath the smooth top for precise user feedback. Unit shall operate on 120 volts 9 amps.

CookTek
810 West Washington Blvd.
Chicago, Illinois 60607 USA
www.cooktek.com

Tel: 1.312.563.9600 Fax: 1.312.432.6220
Toll Free: 1.888.COOKTEK (266-5835)
Toll Free Fax: 1.888.COOKFAX (266-5329)

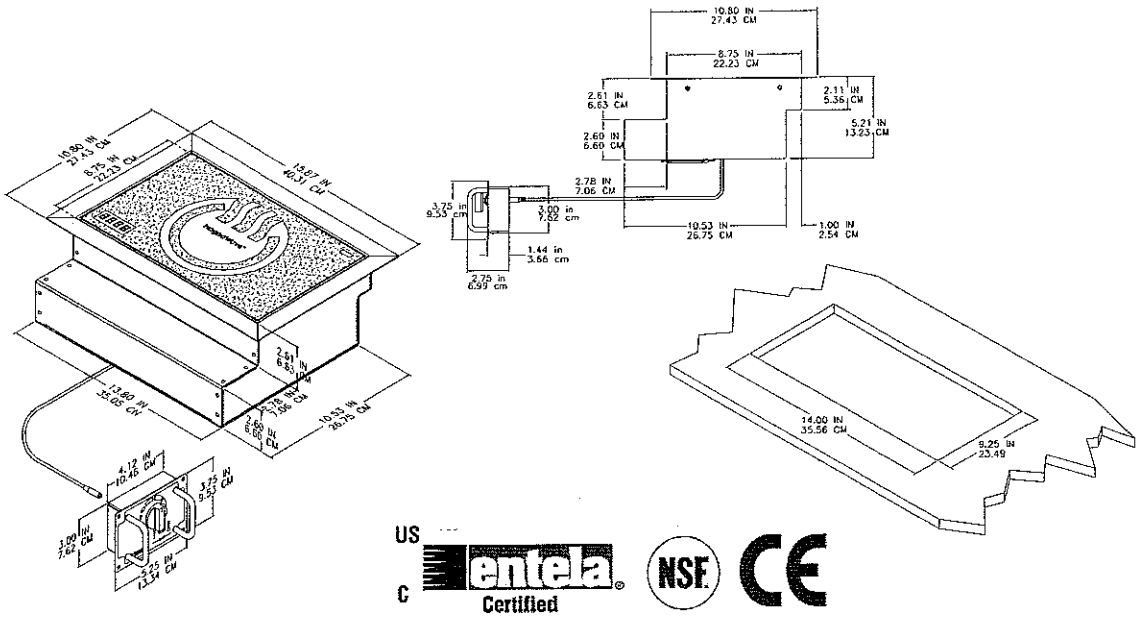
MADE IN THE USA

DROP-IN MELTING POT MPD 1000

CookTek® MagnaWave® Systems

CookTek®
MagnaWave™ Systems

DROP-IN MELTING POT
MPD 1000



US C entela® Certified NSF CE

SPECIFICATIONS

Model Number		**MPD 1000**
Power requirements		120V, 1PH
Power consumption		500W-1000W
Voltage		120V, 50/60Hz
Amperage		9 amps at 120V
Power range		500 - 1000W
Dimensions	(Inches)	12.54L x 15.87W x 5.21H
	(cm)	31.85L x 40.31W x 13.23H
Weight		16 lbs. / 7.3 kg
Packaged Weight		20lbs. lbs. / 9.1 kg
Packaged Dimensions	(Inches)	21.0L x 19.0W x 9.0H
	(cm)	52.70L x 47.60W x 22.90H
Cord length & Plug type		6 ft, NEMA 5-15P
Warranty		One year limited warranty against manufacturer defects
Cooling clearance		2" (5.1 cm) front, rear and sides 9" (15.3 cm) bottom

Note: Many local codes exist, and it is the Owner and Installer's responsibility to comply with those codes. It's CookTek's policy to continually improve its products, and we reserve the right to change or improve our specifications without notification.

CookTek
810 West Washington Blvd.
Chicago, Illinois 60607 USA
www.cooktek.com

Tel: 1.312.563.9600 Fax: 1.312.432.6220
Toll Free: 1.888.COOKTEK (266-5835)
Toll Free Fax: 1.888.COOKFAX (266-5329)

MADE IN THE USA

DROP-IN MELTING POT MPD 1000

CookTek® MagnaWave™ Systems

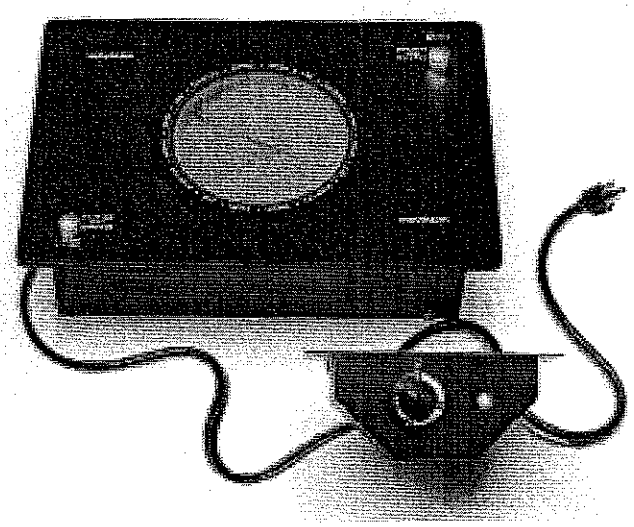
mosshaim

taking technology to task-

Item Number

The Commercial *Series**S*** *Mini**PRO*** Portable/Drop-In Stove Top

CVM-51100B



Sanitation
NSFI 4 – 1999

Limited One-Year Warranty:
The Mosshaim Innovations stove tops are fully warranted from date of shipment for one year to be free from defects in material or workmanship. Any stove tops found to be defective in material or workmanship may be sent back to the company at customer's expense for repair or replacement.

This warranty does not extend to any stove tops which have been subjected to misuse, abuse, accident, negligence, exposure to the elements or chemicals, alteration or unauthorized repair.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDED BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTIBILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. IN NO EVENT WILL THE COMPANY BE LIABLE FOR SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES OR LOSS.

This New, Powerful, Compact, **Portable/Drop-In Stove Top** is Perfect for Any Mobile or Remote Cooking Operation, Including Room Service Carts, Tables, Counters, Bars... — anywhere space is at a premium and a standard 15 Amp outlet is available.

There is nothing like the Mosshaim *Mini**PRO*** on the market. It features a state-of-the-art 1000W infrared burner under a tough, durable and yet beautiful ceramic glass surface. And with its unique drop-in design, detachable 15 Amp cord set, and under-the-surface, snap-in, remote-mounted control box, the *Mini**PRO*** gives you total flexibility!

The *Mini**PRO*** heats up to 700° F in seconds and like all Mosshaim burners, it cooks with residual heat, thereby saving you money in energy costs when compared with other electric burner technologies.

Please note: The length of the cord from the control module to the outlet is six feet (photograph shown has been modified for aesthetic purposes).

mosshaim
taking technology to task

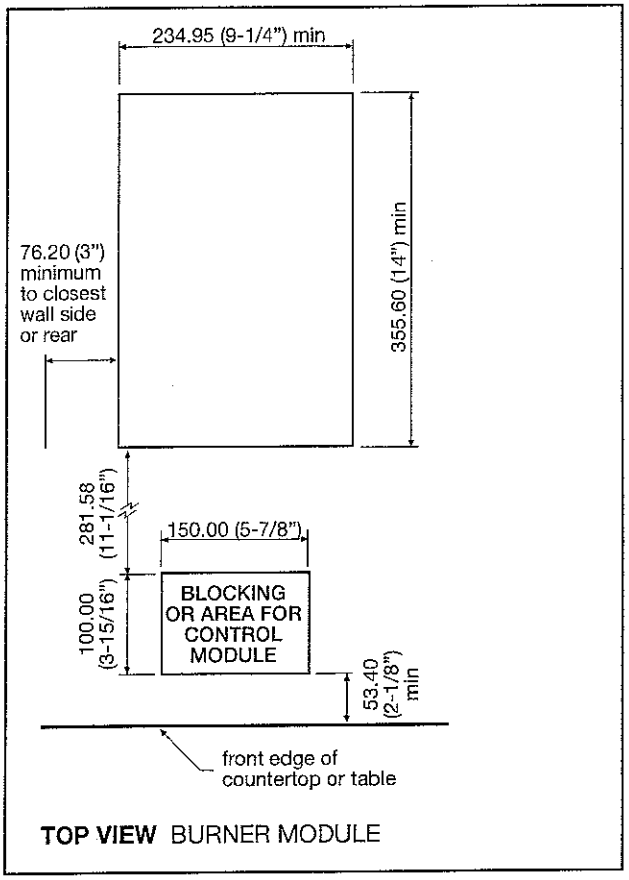
Mosshaim Innovations, Inc.
772 Busch Court
Columbus, OH 43229
phone 614.985.3000
toll-free 888.995.7775
FAX 614.985.0703

www.mosshaim.com

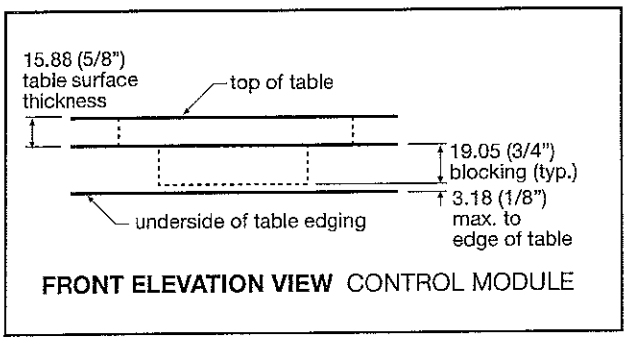
specification approval

Printed in the U.S.A. (11/9/01)

The Commercial *SeriesS MiniPRO* Portable/Drop-In Stove Top CVM-51100B



TOP VIEW BURNER MODULE



FRONT ELEVATION VIEW CONTROL MODULE

LISTED

Sanitation NSFI 4 – 1999

Dimensions
Surface: 10.75" x 15.50" (273.05 mm x 393.70 mm)
Depth: 3.93" (100.00 mm)
Height Above Counter: Flush Mounted or .3125" (7.20 mm)
Burner Diameter: 6.50" (165.10 mm)
Remote Mounted Control:
4.00" x 5.90" (101.60 mm x 150.00mm)

Control Module Mounting Options
Under Table Only

Shipping Weights
Unpacked: 13 lbs. (5.9 kg)
Packed: 15 lbs. (6.8 kg)

Clearances
Consult the Installation Guide
Consult Local Building Codes For Ventilation Requirements
Min. Clearance Above Stove Top Surface: 30" (762.00 mm)
Min. Clearance Under Stove Top Housing: 3.50" (88.90 mm)

Utilities

15 Amp / 120 Volt Grounded Outlet

Bidding Specifications

- Counter-Top or Flush-Mounted One Piece Ceramic Glass Surface
- One 1000W Infrared Ribbon Burner/3500BTU
- Oscillating On-Off Burner Technology for Energy Savings
- Heated Diameter of Burner: 6.5" (165.10 mm)
- Cooking Surface Temperature Range: 80° F to over 700° F (29° C to 371° C)
- Two Residual Burner Heat Caution Lights on Ceramic Glass Surface
- Patented Heat Control Interior Design
- HOT Written in Four Languages Around Burner Circle
- Infinitely Variable Heat Control Dial on Remote Panel
- Power On Indicator Light on Remote Panel
- Recommended Cookware: ANY Flat-Bottomed Cookware Recommended For Stove Tops
- Quick Disconnect and Removal for Cleaning or Maintenance

Variations, accessories and options

CVM-51100BH	*SeriesS MiniPRO* Hardwired version (no cord)
SJTO	15 Amp Removable Cordset 6'
CVC006	Mosshaim's Ceramic Glass Conditioner/7 oz (200 ml) Helps keep the vitro ceramic glass surface looking like new.

Special logo applications and housing designs have additional costs and are subject to UL and NSF testing.

Mosshaim Innovations, Inc. 772 Busch Court Columbus, OH 43229 www.mosshaim.com
phone 614.985.3000 toll-free 888.995.7775 FAX 614.985.0703

Printed in the U.S.A. (12/7/01)

Executive Summary

The Melting Pot Restaurants, Inc. contracted Pace Analytical Services, Inc. to perform organic condensable emissions engineering testing relative to fondue pots to evaluate oil volatilization from cooking. The experiment was set up and completed at the Pace Analytical laboratory located in Minneapolis, Minnesota. The experiment was performed on June 13, 2002. Results are summarized in the following table:

Test Results Summary

Parameter	Run 1	Run 2	Run 3	Average
Condensable Organics mg/scm	1.6	1.3	1.2	1.4

This test was performed to satisfy conditions set by the City of Irvine (California) relative to fire prevention and the question of exhaust hoods for each restaurant table. The action level specified by the City of Irvine is 5 mg/scm and these results are well below that value.

The experiment was designed to exceed what could be considered worst case conditions. The results shown are likely higher than what could be achieved in a normal restaurant setting since testing was performed for an above average number of oil pots, higher cooking frequency, less frequent filtering of the oil and a higher volume sampling train.

Results Summary

Results of condensable organic determinations are summarized in Table 1. The concentration of condensable organics range between 1.2 and 1.6 mg/scm with an average of 1.4 mg/scm. The concentration limit specified by the City of Irvine is 5.0 mg/scm.

It should be noted that standard conditions in EPA source testing methods and indoor air quality methods is slightly different. Standard temperature for source measurements is 528°R or 68°F while standard temperature for IAQ measurements is 72°F. In this case, with results reported to two significant figures, the difference is not significant.

The Melting Pot Restaurants, Inc.

Minneapolis, Minnesota
Pace Project No. 0206-022

Table 1

EPA Method 202 Determinations
Fondue Pot Experiment
Test 1

Parameter	Run 1	Run 2	Run 3	Average
Date of Run	6/13/2002	6/13/2002	6/13/2002	6/13/2002
Time of Run	1010-1110	1131-1231	1247-1347	
Sample Duration (Minutes)	60	60	60	
Nominal Oil Temperature (°F)	350	350	350	400
Room Temperature (°F)	75	75	75	75
Ambient Moisture Content (%v/v)	1.7	1.6	2.2	1.8
Sample Volume (dscm)	1.27	1.26	1.18	
Total Constituent Collected (mg)				
Total Condensible Organics	2.1	1.7	1.4	1.7
Constituent Concentration				
mg/dscm				
Total Condensible Organics	1.6	1.3	1.2	1.4
mg/scm				
Total Condensible Organics	1.6	1.3	1.2	1.4

mg/dscm = milligrams per dry standard cubic meter

mg/scm = milligrams per standard cubic meter

STATE OF MICHIGAN
JENNIFER M. GRANHOLM
GOVERNOR
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING
KEITH W. COOLEY
DIRECTOR

September 4, 2008 M-08-16

TO: Members of the Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Appeal Request for Examination

APPLICANT REPRESENTATIVE:

David Sexton

PROJECT:

Not applicable.

AUTHORITY:

The Forbes Mechanical Contractors Act, 1984 PA 192 of the Michigan Compiled Laws.

REQUEST:

Mr. Sexton is requesting to sit for the Mechanical Contractors Examination in the classifications of HVAC, Limited heating service, and Limited refrigeration service.

APPLICABLE RULE:

R 338.903a. of the Board of Mechanical Rules License Examination Procedures

FINDINGS:

Mr. Sexton's application does not fully document his experience. Additionally, his application has not been signed by the contractor of record of Answer Heating and Cooling.

Mr. Sexton has a Class B Air Conditioning and Refrigeration Contractors License issued by the State of Texas. However, it is not clear if the requirements of obtaining that license are equivalent to the requirements of the State of Michigan.

RECOMMENDATION:

Based on the fact that Mr. Sexton does not have the experience as required by Act 192 it is the recommendation of staff to deny this request.

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

STANLEY "SKIP" PRUSS
DIRECTOR

November 5, 2008

Mr. David A. Sexton
3177 Yorkshire Dr.
Bay City, MI 48706

Dear Mr. Sexton:

On November 12, 2008, the Board of Mechanical Rules will hear your appeal of the denial by staff for Mechanical Contractor License Examination that was tabled September 17, 2008.

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

September 2, 2008

Mr. David A. Sexton
3177 Yorkshire Dr.
Bay City, MI 48706

Dear Mr. Sexton:

On September 17, 2008, the Board of Mechanical Rules will hear your appeal of the denial by staff for Mechanical Contractor License Examination.

If you would like input on this action, you should be present at the Okemos Office Building, 2501 Woodlake Circle, Okemos, Michigan at 9:00 a.m. in Conference Room 3.

The meeting site is accessible, including handicapped parking. Individuals attending the meeting are requested to refrain from using heavily scented personal care products, in order to enhance accessibility for everyone. People with disabilities requiring additional accommodations in order to participate in the meeting should contact the Mechanical Division at 517/241-9325 at least (10) working days before the event.

If I can be of further assistance, you may contact me.

Sincerely,

Tennison B. Barry, Chief
Mechanical Division

TBB/cct

RECEIVED

JUL 21 2008

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Application for Mechanical Contractor License Examination

Michigan Department of Labor & Economic Growth
Bureau of Construction Codes / Mechanical Division
P.O. Box 30255, Lansing, MI 48909
517-241-9325
www.michigan.gov/bcc

Application Fee: $25.00 (nonrefundable)

Authority: 1984 PA 192 Completion: Mandatory Penalty: License will not be issued	The Department of Labor and Economic Growth will not discriminate against any individual or group because of race, sex, religion, age, national origin, color, marital status, disability, or political beliefs. If you need help with reading, writing, hearing, etc., under the Americans with Disabilities Act, you may make your needs known to this agency.

Tran Info:127 14153152-1 07/18/08
ChkN: 1278 Amt: $25.00
ID: DAVID SEXTON

Instructions:

- Complete and sign application. Type or print in ink.
- Application must be received in the Bureau office not less than 20 working days before next scheduled exam.
- P.A. 236 of 1996, as amended, requires an applicant to include his or her social security number. However, a requirement under this section to include a social security number on an application does not apply to an applicant who demonstrates he or she is exempt under law from obtaining a social security number or to an applicant who for religious convictions is exempt under law from disclosure of his or her social security number under these circumstances.
  - This information is confidential. Disclosure of confidential information is protected by the Federal Privacy Act.
- Enclose a check made payable to the **State of Michigan**.
- Mail completed application and fee to the address above.

Applicant Information

CONTRACTOR LICENSE NUMBER - LICENSE UPGRADE ONLY: 71 -

NAME (Last, First, Middle) No Initials: Sexton, David, Alvin

DATE OF BIRTH:

ADDRESS	CITY	COUNTY	STATE	
3177 Yorkshire Dr.	Bay City	Bay	MI	48706

SOCIAL SECURITY NUMBER:

TELEPHONE NUMBER (Include Area Code):

Work Classifications (Check work classifications for which you are seeking licensure)

☐ **1. Hydronic heating and cooling and process piping.**
(Means the application of equipment and systems which provide air conditioning by the controlled forced circulation of fluids or vapors in pipes.)

☑ **2. HVAC equipment.**
(Means the application of equipment and systems to provide air conditioning for occupants of buildings and structures. HVAC does not include the installation of portable self-contained refrigeration equipment and window type air conditioners of not more than 1 1/2 horsepower.)

☐ **3. Ductwork.**
(Means the air distribution arrangement for supply, return and exhaust in air conditioning systems and in non-air conditioning systems, the materials and methods of which are specified in the Michigan Mechanical Code. Ductwork includes flues, vents and chimneys.)

☐ **4. Refrigeration.**
(Means the use of equipment and systems including refrigeration piping, employing the refrigeration cycle to generate low temperatures for other than air condition equipment and systems. Refrigeration includes such equipment and systems as supermarket refrigeration, industrial refrigeration, the preservation of biological materials and food storage facilities. Refrigeration does not include the installation of portable self-contained units such as refrigerators, dehumidifiers and other similar equipment of not more than 1.5 horsepower or other equipment exempted from the Michigan Mechanical Code.)

☑ **5. Limited heating service.**
(Means the servicing of gas-designed sectional boilers having inputs of not more than 1 million Btu's, utilizing a combustion safeguard designed to shut off the main gas supply 10 or less seconds after pilot flame failure, and all other gas-fired or solid fuel equipment and systems limited to input ratings of less than 400,000 Btu's per unit; or oil-fired equipment and systems designed for the use of number 1 or number 2 fuel oil, having a maximum firing rate of less than five gallons per hours per unit; or electrical furnaces and electric boilers using the same kilowatts that are equivalent to the fossil fuel British thermal units generated.)

☐ **6. Unlimited heating service.**
(Means the servicing of heating equipment and systems without restrictions concerning thermal capacity or grade of fuel oil or type of fuel.)

☑ **7. Limited refrigeration and air conditioning service.**
(Means the servicing of refrigeration equipment and systems and air conditioning equipment and systems employing the refrigeration cycle unlimited capacity utilizing group one refrigerants as listed in the Michigan Mechanical Code.)

☐ **8. Unlimited refrigeration and air conditioning service.**
(Means the servicing of refrigeration equipment and systems and air conditioning equipment and systems employing the refrigeration cycle unlimited as to thermal capacity or type of refrigerant.)

☐ **9. Fire Suppression.**
(Means the integrated combination of a fire alarm system and fire suppression equipment which as a result of predetermined temperature, rate of temperature rise, products of combustion, flame, or human intervention will discharge a fire extinguishing substance over a fire area.)

☐ **10. Specialty License.**
(Means a license to perform work within limits established by the board in one of the work classifications set forth below, for the installation and servicing of:)

- ☐ a. Solar.
- ☐ b. Solid fuel.
- ☐ c. LP tank and pipe.
- ☐ d. Underground tank and pipe.
- ☐ e. Gas piping.
- ☐ f. Gas piping and venting.

Experience Record

It is necessary to show a minimum of 3 years experience in one or more of the work classifications. List your present employer first. Describe the type of work performed in detail to enable the reviewer to correctly evaluate your qualifications. Describe the work classifications you have had experience in and the length of time you performed the work. Have each contractor of record certify your dates of employment and have their signatures notarized. Attach extra sheets if necessary.

EMPLOYER NAME	DATES EMPLOYED (Month / Day / Year)
Answer Heating & Cooling	FROM: 12/2005 TO: 6/2008
ADDRESS	**TYPE OF WORK PERFORMED**
8490 Midland Rd.	☑ Residential ☑ Full-Time
CITY / STATE / ZIP CODE	☑ Commercial ☐ Part-Time
Freeland / MI / 48623	☐ Industrial Hours per week _____

DESCRIPTION OF WORK PERFORMED (Include experience in specific work classifications)

Residential and light commercial service and repair

Employer Complete The Following

I hereby certify the applicant was in my employ during the period stated and the applicant's description of experience on this application is accurate.

SIGNATURE OF CONTRACTOR OF RECORD | DATE

NAME OF CONTRACTOR OF RECORD (No Initials)

LICENSE NUMBER | TELEPHONE NUMBER (Include Area Code)

Subscribed and sworn before me, this _____ day of _____, 20___,

a Notary Public in and for _____ County, Michigan.

Signature of Notary Public _____

My Commission expires: _____, 20___.

Experience Record

It is necessary to show a minimum of 3 years experience in one or more of the work classifications. List your present employer first. Describe the type of work performed in detail to enable the reviewer to correctly evaluate your qualifications. Describe the work classifications you have had experience in and the length of time you performed the work. Have each contractor of record certify your dates of employment and have their signatures notarized. Attach extra sheets if necessary.

EMPLOYER NAME	DATES EMPLOYED (Month / Day / Year)
Sexton Air Conditioning, Self Employed	FROM: 1995 TO: 2005
ADDRESS	**TYPE OF WORK PERFORMED**
201 Murray Ln.	☑ Residential ☑ Full-Time
CITY / STATE / ZIP CODE	☑ Commercial ☐ Part-Time
Richardson / TX / 75080	☐ Industrial Hours per week _____

DESCRIPTION OF WORK PERFORMED (Include experience in specific work classifications)

Residential and light commercial- all aspects- service, install, duct work, billing, and advertising

Employer Complete The Following

I hereby certify the applicant was in my employ during the period stated and the applicant's description of experience on this application is accurate.

SIGNATURE OF CONTRACTOR OF RECORD | DATE

NAME OF CONTRACTOR OF RECORD (No Initials)

LICENSE NUMBER | TELEPHONE NUMBER (Include Area Code)

Subscribed and sworn before me, this _____ day of _____, 20___,

a Notary Public in and for _____ County, Michigan.

Signature of Notary Public _____

My Commission expires: _____, 20___.

Experience Record

It is necessary to show a minimum of 3 years experience in one or more of the work classifications. List your present employer first. Describe the type of work performed in detail to enable the reviewer to correctly evaluate your qualifications. Describe the work classifications you have had experience in and the length of time you performed the work. Have each contractor of record certify your dates of employment and have their signatures notarized. Attach extra sheets if necessary.

EMPLOYER NAME	DATES EMPLOYED (Month / Day / Year)
Smithco Engineering	FROM: 1992 TO: 1995
ADDRESS: 714 Sherman St.	TYPE OF WORK PERFORMED: ☑ Residential ☑ Full-Time; ☑ Commercial ☐ Part-Time; ☐ Industrial Hours per week _____
CITY: Richardson STATE: TX ZIP CODE: 75080	
DESCRIPTION OF WORK PERFORMED (Include experience in specific work classifications): Service and Installation	

Employer Complete The Following

I hereby certify the applicant was in my employ during the period stated and the applicant's description of experience on this application is accurate.

SIGNATURE OF CONTRACTOR OF RECORD	DATE

NAME OF CONTRACTOR OF RECORD (No Initials)

LICENSE NUMBER	TELEPHONE NUMBER (Include Area Code)

Subscribed and sworn before me, this _____ day of _____, 20____,

a Notary Public in and for _____ County, Michigan.

Signature of Notary Public _____

My Commission expires: _____, 20____.

Certification and Signature (MUST BE SIGNED BY ALL APPLICANTS)

I certify all information in this application is true and complete and I agree and understand any falsification of material facts will result in my forfeiting any rights of consideration for examination and issuance of a mechanical contractor's license in the state of Michigan.

SIGNATURE OF APPLICANT	DATE
W. Smith	7/15/08

Trade School

Have you attended a recognized trade school? ☑ Yes ☐ No

If yes and you are requesting credit, attach a copy of your official transcript and your original diploma or certificate of completion.

Examination Location

Examinations are given at the sites listed below. Refer to the enclosed "Mechanical Contractor Examination Schedule" for examination dates. Please check below the site you wish to be examined at and indicate a preference of examination date. If approved for examination, an admission card will be mailed to you approximately 10 days prior to the examination date. If the examination you have selected is full, you will be scheduled for the next available examination at your preferred site.

Preferred Site	Preferred Date	
☑ Lansing Area	_____	
☐ Escanaba	_____	☒ No Preference - Next Available Examination

If you have a learning disability, a psychological disability, or other hidden disability that requires an accommodation in testing, submit written documentation from an appropriate professional (education professional; doctor, psychologist, psychiatrist) to certify that your disabling condition requires the requested test accommodation. Forms are available from this office.

Background Information

Have you been convicted a felony or misdemeanor? ☐ Yes ☑ No

If yes, complete the Conviction History section below. Failure to accurately respond to this question will result in you forfeiting any rights of consideration for examination and issuance of a mechanical contractor's license in the state of Michigan.

Conviction History

In accordance with the Former Offenders Act, 1974 PA 381, this is to provide you with an opportunity to explain your affirmative response to the question above which asked if you had been convicted of a felony or misdemeanor.

If you are unsure of exact details, respond to the best of your knowledge. The information requested on this form is required under 1984 PA 192 and will be used to process your application. Attach additional sheet(s) if necessary.

YOUR NAME WHEN CONVICTED

INDICATE CONVICTION(S) FOR WHICH YOU WERE CHARGED

DATE(S) OF CONVICTION(S) AND SENTENCE(S)

NAME AND ADDRESS OF SENTENCING COURT(S)

CHECK YES OR NO TO THE FOLLOWING

1. Are you a current inmate? ☐ Yes ☑ No
2. Are you currently on probation / parole? ☐ Yes ☑ No
3. If yes, provide the name, address and telephone number of the correctional facility, probation officer or parole officer.

RELEASE DATE FROM CUSTODY, PROBATION OR PAROLE

REHABILITATION PROGRAMS ENROLLED IN OR COMPLETED

Conviction History Certification and Signature (To be signed only if Conviction History section above is completed)

I hereby certify the statements and facts provided are true and accurate to the best of my knowledge. By signing this form, I give my permission to allow the Bureau of Construction Codes to contact appropriate agencies regarding my record of conviction(s).

SIGNATURE	DATE

July 28, 2008

David Sexton
3177 Yorkshire Dr
Bay City, MI 48706

Dear Mr. Sexton:

The Mechanical Division has received your application for Mechanical Contractor Licensing Examination. Upon review, it has been determined that the following information is required before you can be scheduled for examination:

Your application does not show documentation of your work experience. Rule 903(1) requires that the applicant have a minimum of three years experience in one or more of the work classifications set forth in the Act. Your application indicates that you do not have three years of experience.

Your application was not notarized. Rule 903(1) requires the applicant to furnish notarized statements from employers. Please have your application notarized by your employer and return the enclosed application.

If appropriate, return the required information along with this letter to: Department of Labor & Economic Growth, Bureau of Construction Codes, Mechanical Division, P.O. Box 30254, Lansing, Michigan 48909. If we do not receive a response within 15 days from the date of this letter, your application for examination will be denied in accordance with Rule 902(5) and (6).

If you have any questions regarding the information in this letter, please contact this office at 517/241-9325, preferably after 10:00 a.m. on weekdays.

Sincerely,

Kevin Kalakay, Assistant Chief
Mechanical Division

KDK/tl

TO: MICHIGAN DEPARTMENT OF LABOR & ECONOMIC GROWTH
MECHANICAL DIVISION

REASON: REQUESTING AN APPOINTMENT BEFORE THE BOARD

PLEASE ALLOW ME AN AUDIENCE WITH THE BOARD TO SHOW EVIDENCE OF MY HISTORY IN THE HVAC INDUSTRY. I HAVE HAD 20 YEARS OF EXPERIENCE AS A SERVICE TECH, INSTALLER, OWNING AND RUNNING A SMALL BUSINESS OF MY OWN. THIS IS TO ALLOW ME TO TAKE THE MECHANICAL CONTRACTOR LICENSE EXAM. THANK YOU.

SINCERELY,
DAVID A. SEXTON

3177 Yorkshire Dr.
Bay City MI 48706
Phone

David A Sexton

Objective

To secure a job in the HVAC industry as a service technician.

I have excellent customer service skills. I present a good image and I am honest. Being in business for myself has helped me to develop the knowledge and skills needed to work for your company.

I have 20 years experience and would like to continue in this field.

Work experience

1988-1991 Cosby Service Dallas TX
HVAC Technician
Worked in all aspects of air conditioning and heating installation and service

1991-1992 Trans Cities Dallas TX
HVAC Technician
Worked in all aspects of air conditioning and heating installation and service

1992-1995 Smithco Engineering Richardson, TX
HVAC Technician
Worked in all aspects of air conditioning and heating installation and service

1995-2005 Sexton Air Conditioning Richardson, TX
Self Employed. Licensed through the State of Texas
Residential sales, service and installation.

2005-2008 Answer Heating and Cooling Freeland, MI
HVAC Technician
Worked in all aspects of air conditioning and heating installation and service

Accreditations

North American Technician Excellence (NATE)

Air Conditioning

Gas Furnaces

EPA

Refrigerant Certification

Universal Technician as required by 40 CFR part 82, subpart F.

AIR CONDITIONING AND REFRIGERATION CONTRACTORS LICENSE

LICENSE NUMBER
TACLB012492E

DAVID A SEXTON

ADDRESS

201 MURRAY
RICHARDSON, TX 75080

BUSINESS AFFILIATION

DAVID A SEXTON
201 MURRAY
RICHARDSON, TX 75080

CLASS

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This license is affiliated with the above business and may not simultaneously be assigned to any other business.
The license holder must be an employee or owner of the business.

ENDORSEMENTS

ENVIRONMENTAL AIR CONDITIONING

ISSUED BY THE
TEXAS DEPARTMENT OF LICENSING AND REGULATION
P.O. BOX 12157
AUSTIN, TEXAS 78711

DATE ISSUED: JUNE 28TH, 2000

William H. Kuntz, Jr. , Executive Director

EXPIRES: JUNE 28TH, 2003

No. 62277

Tested By: Lennox Industries, Richardson, TX

North American Technician Excellence

Be It known that

David A Sexton

has successfully passed the examinations administered by
North American Technician Excellence
and is awarded this certificate as evidence of competency as a(n)

Air Conditioning — Service Technician

Rex P. Boynton, President

Test Date: April 25, 2006

Certification Date: May 11, 2006

NATE ID # 3083102

Certificate Issue Date: May 12, 2006

Certification Expires: May 2011

Tested By: Lennox Industries, Richardson, TX

North American Technician Excellence

Be it known that

David A Sexton

has successfully passed the examinations administered by
North American Technician Excellence
and is awarded this certificate as evidence of competency as a(n)

Gas Furnaces — Service Technician

Rex P. Boynton, President

Test Date: April 25, 2006

Certification Date: May 11, 2006

NATE ID # 3083102

Certificate Issue Date: May 12, 2006

Certification Expires: May 2011

This Is To Certify That

David Sexton

Has Completed The Following Course Of Study:

Heating & Air Conditioning
Amana®
ULTRA
Air Conditioning Systems

Installation and Service

This 22nd *Day of* March, 2002.

Seminar Leader

John Allen, Amana Training Manager

ARI

gama

CERTIFICATE OF COMPETENCY

AWARDED TO

David A. Sexton

FOR SUCCESSFULLY PASSING THE

RESIDENTIAL AIR CONDITIONING AND HEATING ARI/GAMA COMPETENCY EXAMINATION

JUNE 1988

Arnold W Braswell

ARNOLD W. BRASWELL
PRESIDENT
AIR-CONDITIONING AND REFRIGERATION INSTITUTE

Harry A Paynter

HARRY A. PAYNTER
PRESIDENT
GAS APPLIANCE MANUFACTURERS ASSOCIATION

AMERICAN TRADES INSTITUTE

CERTIFIES THAT

David A. Sexton

has successfully completed the prescribed course of instruction in

Air Conditioning, Heating, and Refrigeration

as developed and taught by this Institute and thus having shown proficiency in the skills of the trade, is hereby found worthy to receive and is awarded this

DIPLOMA

as a certificate of graduation and is emblematic of ability and aptitude in this field.

May 6, 1988

DALLAS, TEXAS

ATI

A.T.I. AMERICAN TRADES INSTITUTE

President - Director

Refrigerant Certification Services
1 800 597-9291

David Sexton

has been Certified as

Universal Technician

as required by 40 CFR part 82, subpart F.

Certification Number 40158
Issue Date 8/25/94
EPA Approval Date 03/30/94

SEXTON AIR CONDITIONING & HEATING

David Sexton, Owner & Operator

(972)480-8580

RESIDENTIAL & COMMERCIAL
Sales, Service, Installation
WE SERVICE ALL MAKES & MODELS

VISA TAC1B012492E

10% SENIOR DISCOUNT

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SUMMER TUNE-UP

$29.95

- Check Freon • Check Connectors
- Check Amp Draws • Oil Motor
- Check Filters • Wash Condendser
- Check Temperature Drop

With coupon. Limited Time Offer

CHANGE-OUT SPECIAL

TRANE 3-TON COMPLETE SYSTEM

$2795

Up Flow Only

Includes normal installation on existing coppper, slab, electric.

With coupon. Limited Time Offer

CHANGE-OUT SPECIAL

3-TON A/C

$1190

Includes normal installation on existing coppper, slab, electric.

With coupon. Limited Time Offer

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JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF LABOR & ECONOMIC GROWTH
LANSING

KEITH W. COOLEY
DIRECTOR

September 4, 2008

M-08-11

TO: Members of the Board of Mechanical Rules

FROM: Tennison B. Barry, Chief, Mechanical Division

SUBJECT: Good Moral Character

APPLICANT REPRESENTATIVE:

Robert Walker

PROJECT:

Not applicable.

AUTHORITY:

The Forbes Mechanical Contractors Act, 1984 PA 192 of the Michigan Compiled Laws.

REQUEST:

Applicant appeals denial of application for license examination. Application was denied based on good moral character.

APPLICABLE RULE:

R 338.903a. of the Board of Mechanical Rules License Examination Procedures

RECOMMENDATION:

Staff has no recommendation.